ORDER NO. AD9512269C8

Service Manual

CD Changer

Compact Disc Changer

SL-CA10

COMPACT disc DIGITAL AUDIO   DIGITAL   MASH※ multi-stage noise shaping

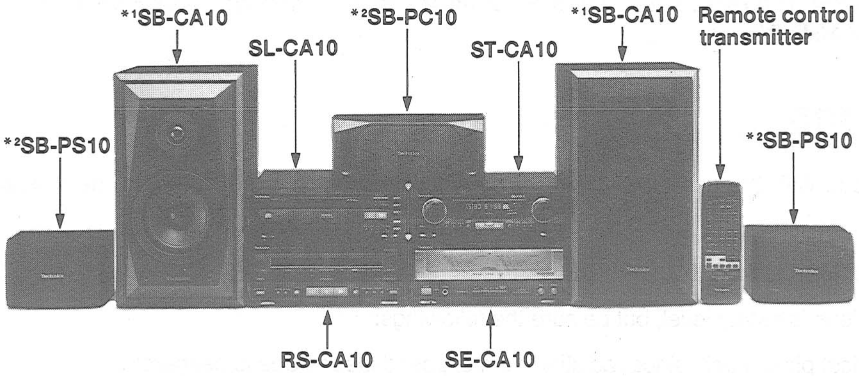
Colour

(K)...Black Type

Area

Suffix for Model No.	Area	Colour
(E)	Europe, Asia, Latin America, Middle East, Africa and Oceania.	(K)

System: SC-CA10



Because of unique interconnecting cables, when a component requires service, send or bring in the entire system.

RAE0150Z MECHANISM SERIES

■SPECIFICATIONS

■Audio

DA converter	1 bit 2 DAC MASH※

■Pickup

Wavelength	780 nm

■General

Dimensions (W×H×D)	280×89×331 mm
Weight	2.5 kg

Notes:

1. Weight and dimensions shown are approximate.
2. Design and specifications are subject to change without notice.

※ MASH is a trademark of NTT.

System	Tuner	CD changer	Amplifier	Cassette deck	Speakers
SC-CA10	ST-CA10	SL-CA10	SE-CA10	RS-CA10	*1 SB-CA10 *2 SB-PC10 (Center) (SB-PC10+SB-PS10)

*1 Made in PAES
*2 For (E, EB, EG) Areas.....Made in PAES
For (GC, GN) Areas.....Made in NABEL

⚠ WARNING
This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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NOTE:
Refer to the service manual for Model No. SE-CA10 (ORDER No. AD9512272C8) for information on "ACCESSORIES", "INSTALLATION ", "CONNECTIONS" and "PACKAGING".

PRECAUTION OF LASER DIODE

CAUTION: This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pickup lens.
Wave length: 780 nm
Maximum output radiation power from pickup: 100 μW/VDE

Laser radiation from the pickup lens is safety level, but be sure the followings:

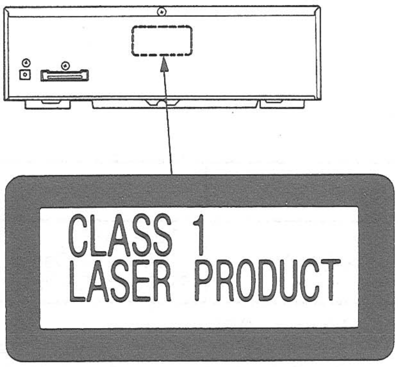
1. Do not disassemble the optical pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pickup lens for a long time.

ACHTUNG: Dieses Produkt enthält eine Laserdiode. Im eingeschalteten Zustand wird unsichtbare Leserstrahlung von der Lasereinheit abgestrahlt.

Wellenlänge: 780 nm
Maximale Strahlungsleistung der Lasereinheit: 100 μW/VDE

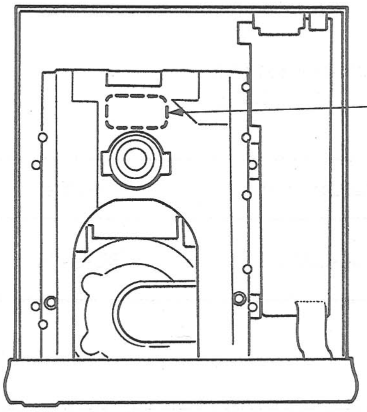
Die Strahlung an der Lasereinheit ist ungefährlich, wenn folgende Punkte beachtet werden:

1. Die Lasereinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Den werkseitig justierten Einstellregler der Lasereinhit nicht verstellen.
3. Nicht mit optischen Instrumenten in die Fokussierlines blicken.
4. Nicht über längere Zeit in die Fokussierlines blicken.



CLASS 1
LASER PRODUCT

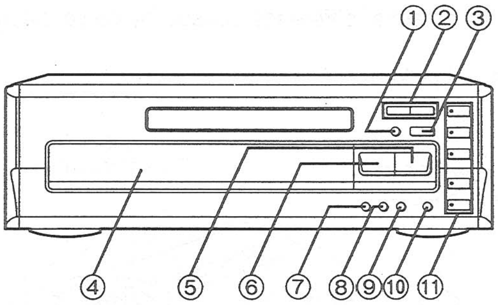
LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT



DANGER	INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.
ADVARSEL	USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARO!	AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTÖNTÄ LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING	OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.
ADVARSEL	USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.
VORSICHT	UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN. RQLS0104

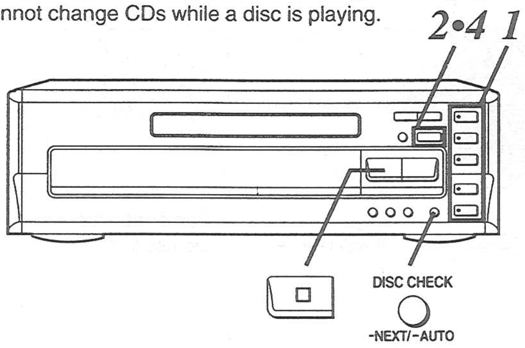
CAUTION!
THIS PRODUCT UTILIZES A LASER.
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

LOCATION OF CONTROL



LISTENING TO COMPACT DISCS

Always stop the changer before loading or changing CDs. You cannot change CDs while a disc is playing.



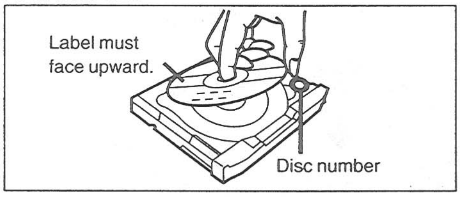
How to load CDs

1 **Press DISC 1–5, whichever you want to open.**

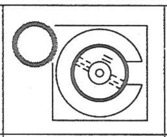
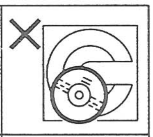
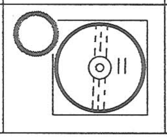
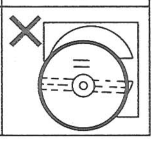
2 **Press ⏏ OPEN/CLOSE.**

3 **Set the CD in the tray.**

- How to hold CDs

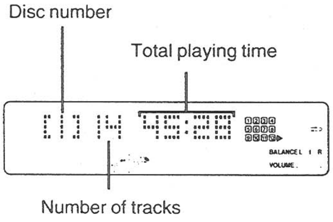


- Load CDs as shown below.

8 cm CD		
12 cm CD		

4 **Press ⏏ OPEN/CLOSE.**

The open tray will close.



① Pause button (❚❚)
② Skip/search buttons (SKIP/SEARCH)
③ Disc tray open/close button (⏏ OPEN/CLOSE)
④ Disc tray
⑤ Play button and indicator (▷)
⑥ Stop button (□)
⑦ Random play button (RANDOM)
⑧ Repeat button (REPEAT)
⑨ AI edit button (AI EDIT)
⑩ Disc check button (DISC CHECK)
⑪ Disc select buttons and indicators (DISC)

5 **To load other CDs, repeat steps 1 through 4.**

For your reference:

If the tray you want to open is already shown on the display, you obviously do not need to perform step 1.

How to check which trays have discs

DISC CHECK is a convenient way to know what discs you have in your changer and where.

Press DISC CHECK (-NEXT).

Not the disc number shown on the display, but the next tray after that will open. For example, when disc 4 is displayed, tray 5 will open.

- Every time you press the button, the next tray opens.
- You can change the CD while the tray is open.
- To close the tray, press ⏏ OPEN/CLOSE.

Hold down DISC CHECK (–AUTO).

The trays will open (and close) automatically one after another. The first one to open will be the next tray after the disc number shown on the display. This way, you can check all trays in a row.

- To stop the auto check in course, press □.

Note

Do not attempt to change CDs while trays are opening and closing in the auto check.

Disc indicators

When you open or close a tray with the ⏏ OPEN/CLOSE button, the changer automatically detects whether there is a CD in the tray or not. The indicator will act as follows.

● (red)	There's a CD in the tray.
Out	There isn't a CD in the tray.

While the CD is playing, its indicator is green.

Note

In the following cases, CD detection is OFF. The indicators will be red whether there is a disc in the tray or not.

- When the tray is closed with DISC CHECK
- When the tray is closed with DISC 1–5
- When the tray is closed by selecting a mode other than CD

For your reference:

While the CD changer is changing discs, the disc indicators act as follows.

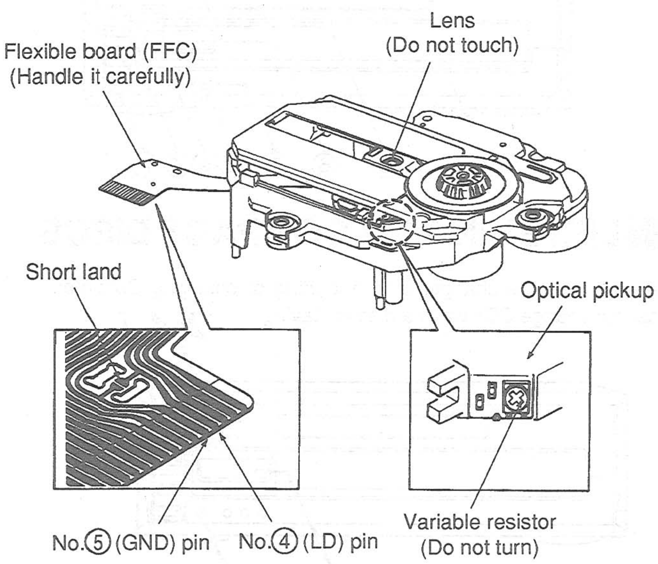
- All the indicators the changer skips through will flash.
- The indicator of the selected disc (or last disc in auto DISC CHECK) will light up.

■HANDLING PRECAUTIONS FOR TRAVERSE DECK

The laser diode in the traverse deck (optical pickup) may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the traverse deck (optical pickup).

● Handling of traverse deck (optical pickup)

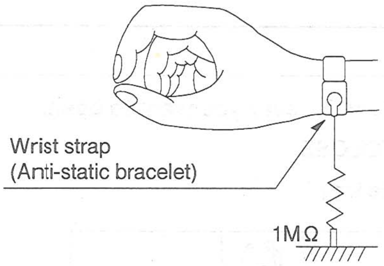
1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. The short land between the No. ④ (LD) and No. ⑤ (GND) pins on the flexible board (FFC) is shorted with a solder build-up to prevent damage to the laser diode.
   To connect to the PC board, be sure to open by removing the solder build-up, and finish the work quickly.
3. Take care not to apply excessive stress to the flexible board (FFC).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

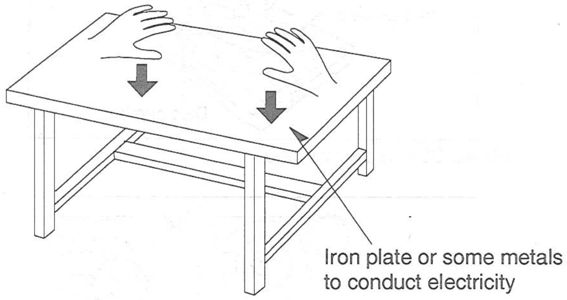

Flexible board (FFC)
(Handle it carefully)
Lens
(Do not touch)
Short land
Optical pickup
No.⑤ (GND) pin
No.④ (LD) pin
Variable resistor
(Do not turn)

● Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to discharge the static electricity from your body.
2. Work table grounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

Caution:
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the traverse deck (optical pickup).


Wrist strap
(Anti-static bracelet)
1MΩ


Iron plate or some metals
to conduct electricity

Operation Check and Main Component Replacement Procedures

NOTE

1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
2. For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.
3. Select items from the following index when checks or replacement are required.
4. Illustrated screws are equivalent to actual size.
5. Refer the parts No. on the page of "Main Component Replacement Procedures", if necessary.

• Contents

• CD Changer Disassembly / Reassembly

page.
1. Removal for the CD changer unit. .... 5.
2. Removal for the traverse unit. .... 7.
3. Disassembly for the CD changer unit. .... 7,8.
4. Reassembly for the CD changer unit. .... 9~12.
5. Inspection for the CD changer unit. .... 12.

• Checking Procedures for each P.C.B.

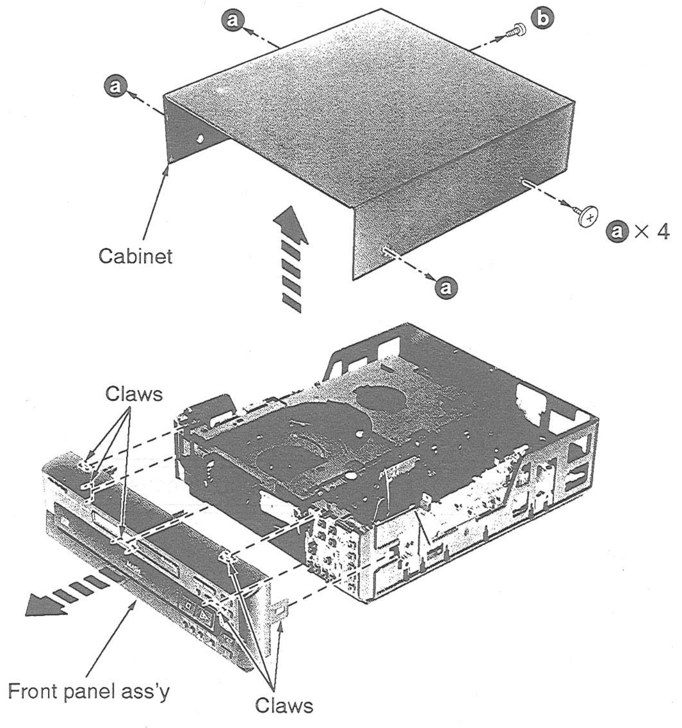
1. Checking for the main P.C.B. and the operation P.C.B.. .... 13.
2. Checking for the servo P.C.B.. .... 13,14.

• Main Component Replacement Procedures

1. Replacement for the traverse deck ass'y. .... 14~16.

CD Changer Disassembly / Reassembly

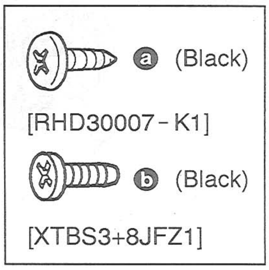
Removal for the CD changer unit

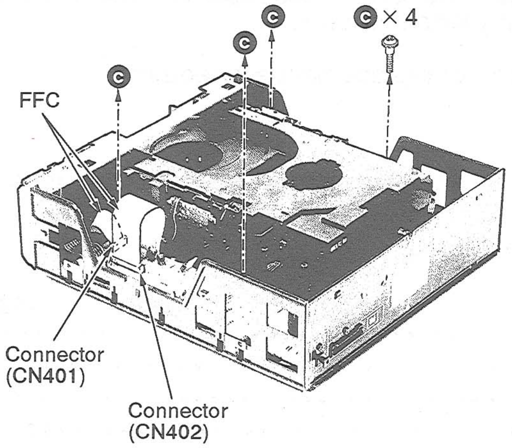


Step 1 Remove the 5 screws.

Step 2 Remove the cabinet.

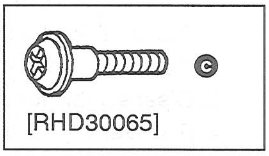
Step 3 Release the 6 claws, and then remove the front panel ass'y.

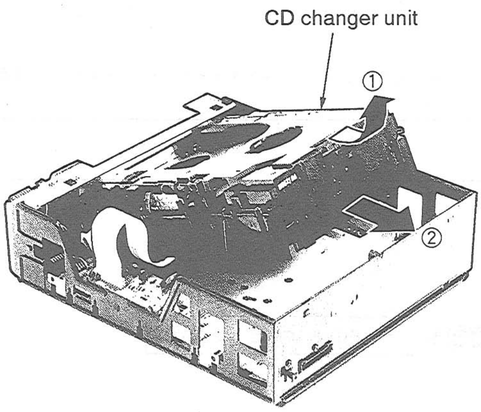



ⓒ × 4
ⓒ
ⓒ
ⓒ
FFC
Connector (CN401)
Connector (CN402)

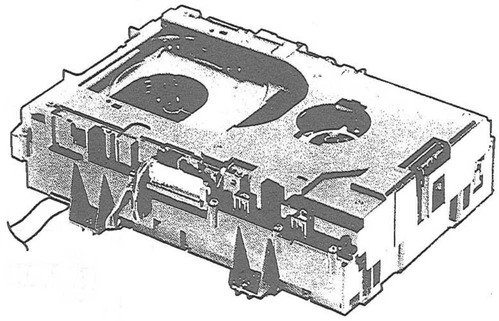
Step 4 Pull out the FFC (2 points).

Step 5 Remove the 4 screws.




CD changer unit
①
②

Step 6 With lifting the rear side of CD changer unit, pull it backward.

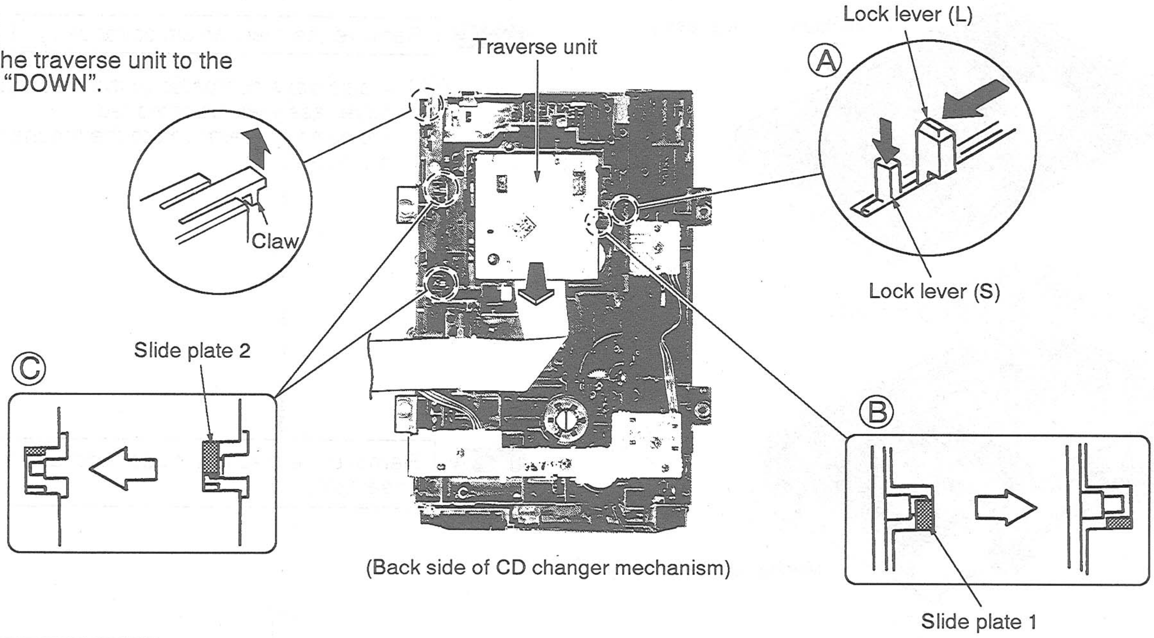


The CD changer unit will be removed.

Removal for the traverse unit

NOTE

Locate the traverse unit to the position "DOWN".


Traverse unit
Lock lever (L)
Ⓐ
Lock lever (S)
Claw
Ⓒ
Slide plate 2
Ⓑ
Slide plate 1

(Back side of CD changer mechanism)

Procedures

Step 1 Push the lock lever (S) with lifting the claw, and then push the lock lever (L) in the direction of arrow (⇒).

Refer to the figure Ⓐ.

⇩

Step 2 The slide plate 1 and 2 of traverse retain boss Ⓑ and Ⓒ are open.

Refer to the figures Ⓑ and Ⓒ.

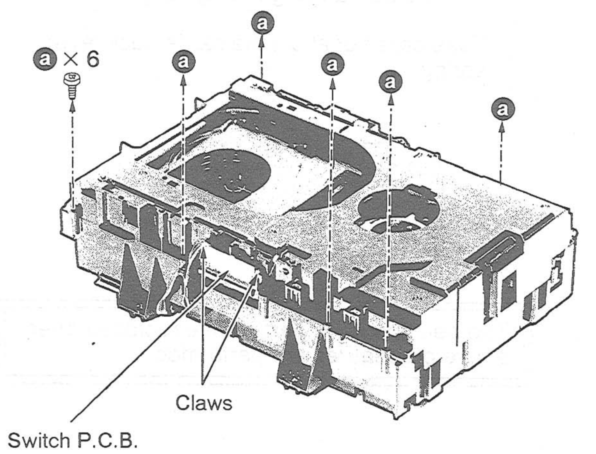
⇩

Step 3 Push the traverse unit in the direction of arrow (⇒).

(The FFC is connected.) ⇩

Step 4 The traverse unit will be removed.

Disassembly for the CD changer unit


ⓐ × 6
ⓐ
ⓐ
ⓐ
ⓐ
ⓐ
ⓐ
Claws
Switch P.C.B.

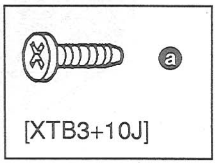
NOTE

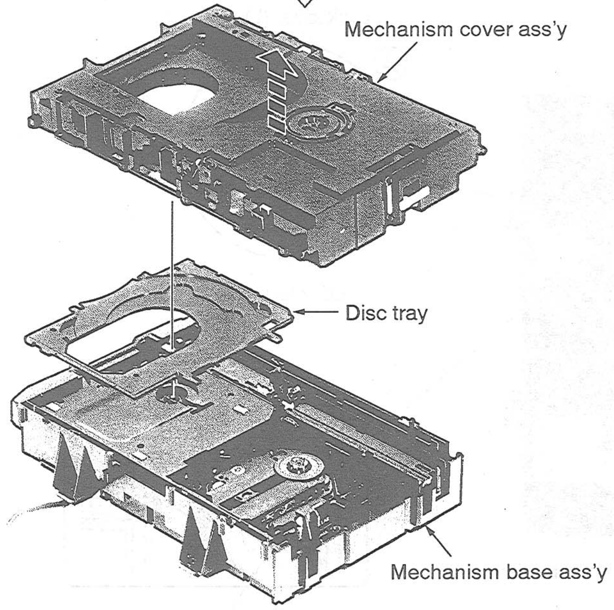
Locate the traverse unit to the position "DOWN".

Step 1 Remove the switch P.C.B..

↓

Step 2 Remove the 6 screws.

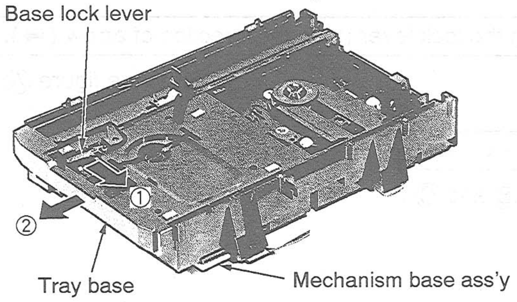



Mechanism cover ass'y
Disc tray
Mechanism base ass'y

Step 3 Remove the mechanism cover ass'y.

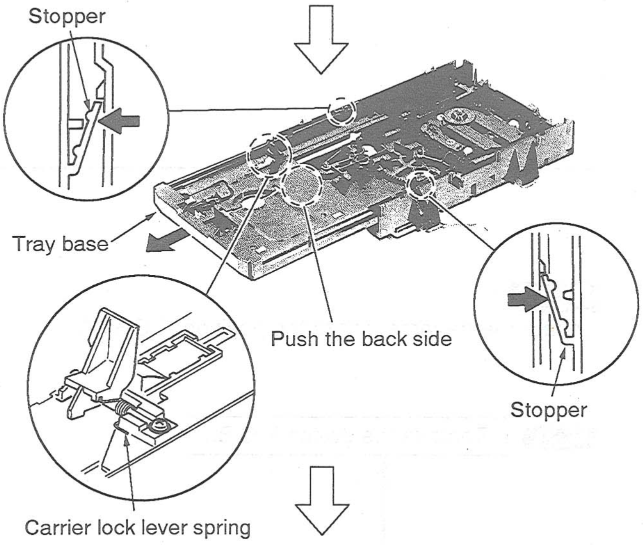
⚠ 4 disc trays contacted to the mechanism cover ass'y will be removed.
1 disc tray is removed to the mechanism base ass'y.

Step 4 Remove the disc tray sided mechanism base ass'y.


Base lock lever
①
②
Tray base
Mechanism base ass'y

Step 5 Unlock the base lock lever.

Step 6 Draw the tray base until it will be stopped.

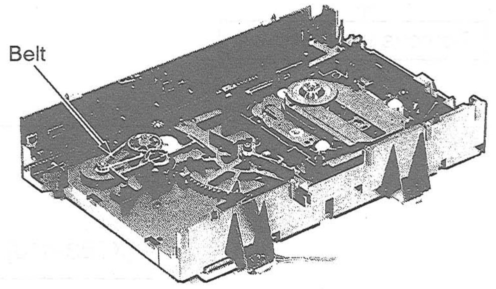

Stopper
Tray base
Push the back side
Stopper
Carrier lock lever spring

Step 7 Release the stopper manually.

Step 8 Draw the tray base.

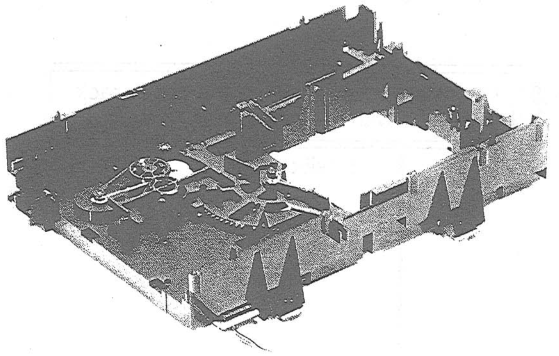
⚠ In case that the tray base can not be open due to hooking, draw the tray base with finger pressing the back side indicated by ◌ of base. (Take care handling of stopper.)

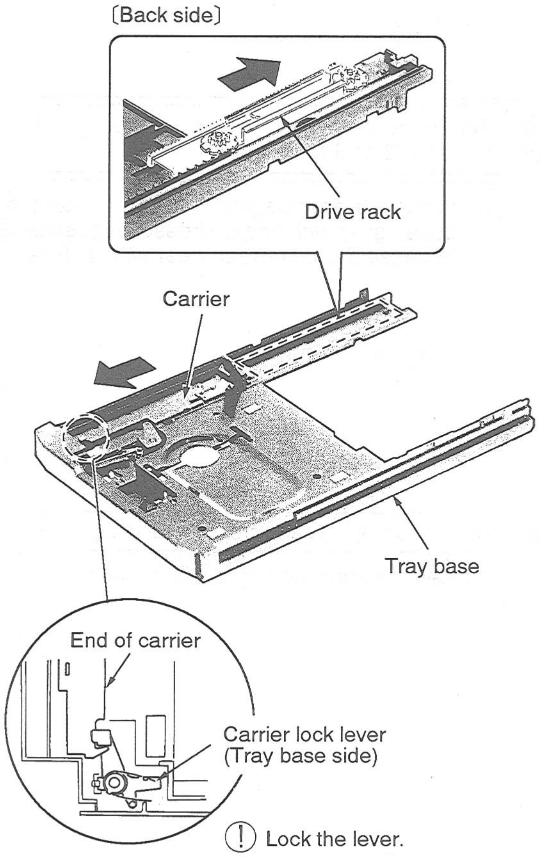
⚠ Take care not avoid the carrier lock lever spring.



The belt and each part can be replaced after above procedures are performed.

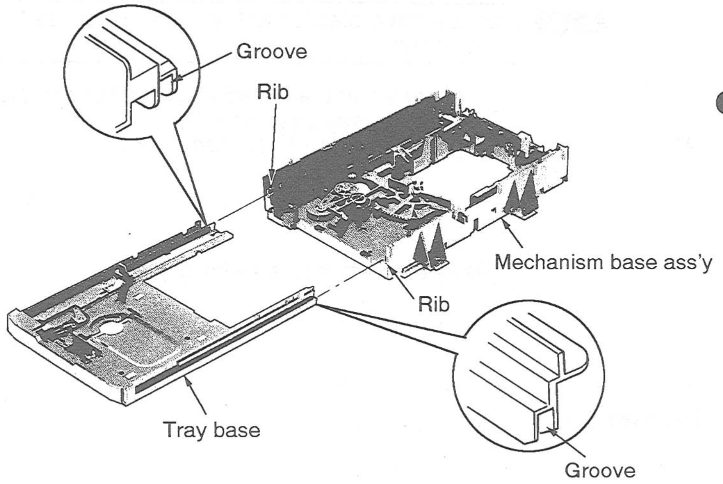
Reassembly for the CD changer unit



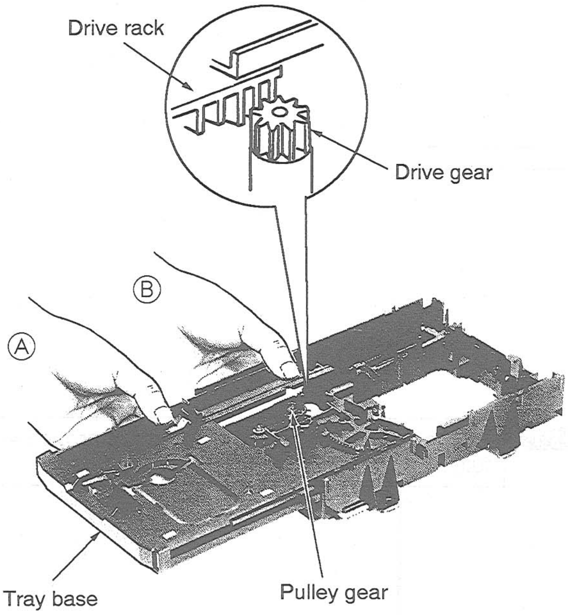

〔Back side〕
Drive rack
Carrier
Tray base
End of carrier
Carrier lock lever
(Tray base side)
Lock the lever.

Step 1 Pull the drive rack in the direction of arrow (⇒) fully.

Step 2 Slide the carrier in the direction of arrow (⇒).


Groove
Rib
Mechanism base ass'y
Rib
Tray base
Groove

Step 3 Insert the tray base to the mechanism base ass'y with keeping the procedures **Step 1** and **Step 2** .


Drive rack
Drive gear
Ⓑ
Ⓐ
Tray base
Pulley gear

Step 4 ◉

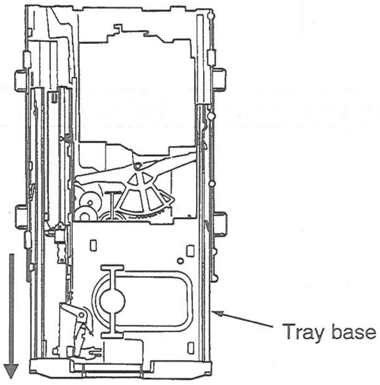
Insert the drive rack until the driver rack interferes with the drive gear.

Position Ⓐ

Step 5 ◉

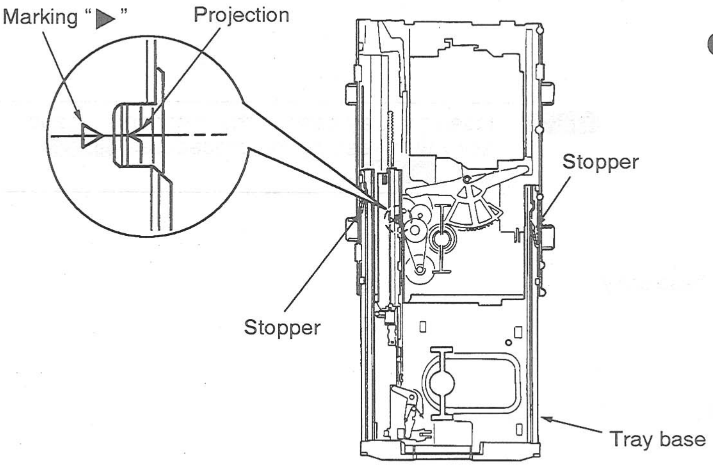
Rotate the pulley gear clockwise gently by hand (5 or 6 times).

(!) When the gear begins to rotate, rotate the pulley gear with finger pressure (position Ⓑ) because the drive rack gear will fall free.



Step 6 Allow the tray base be open manually.

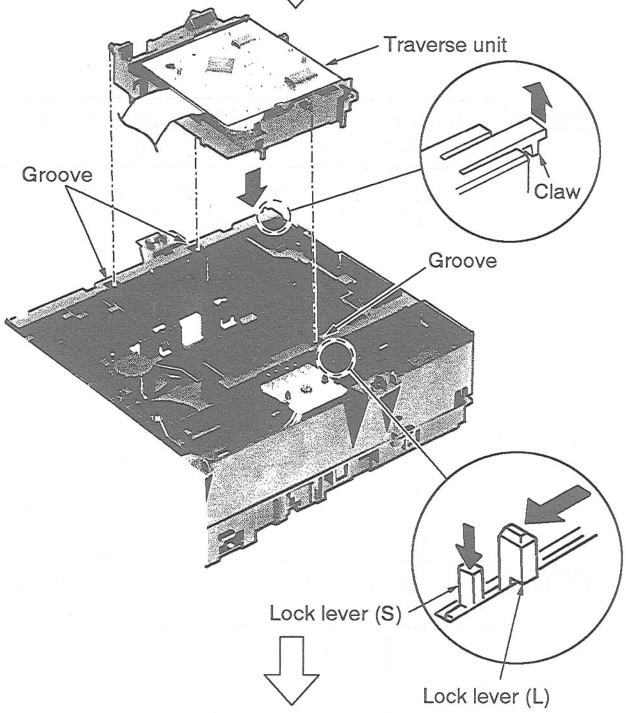
※ Draw the inserted tray base forward.


Marking "▶"
Projection
Stopper
Stopper
Tray base

Step 7 Locate the projection at the marking "▶" as shown left.

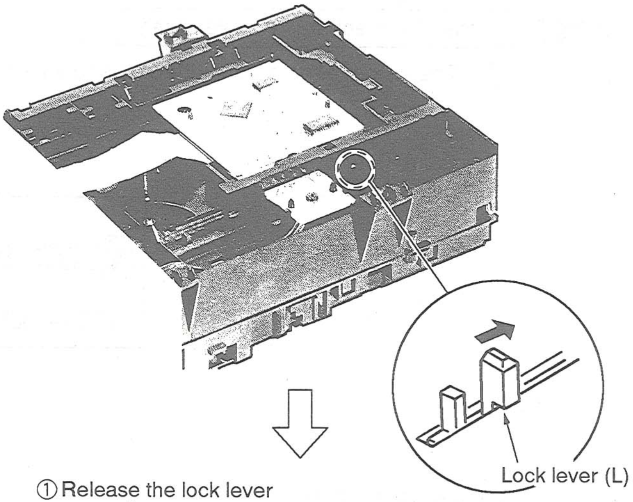
(!) In case that the stated above is not operated draw the tray base again.
(Refer to item (!) on page L–5)

(Retry the item marked with ◉)

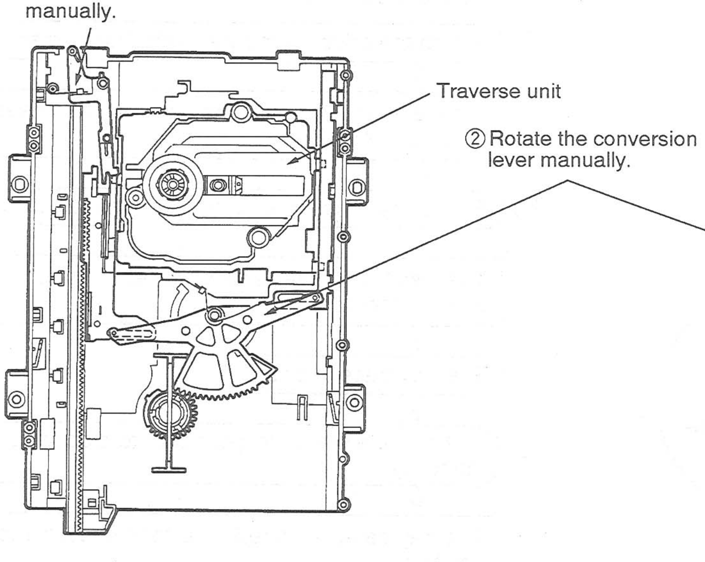

Traverse unit
Groove
Claw
Groove
Lock lever (S)
Lock lever (L)

Step 8 While lifting the claw upward, press the lock lever (L) with forcing the lock lever (S).

Step 9 Align the boss of traverse unit with the groove of mechanism base ass'y.

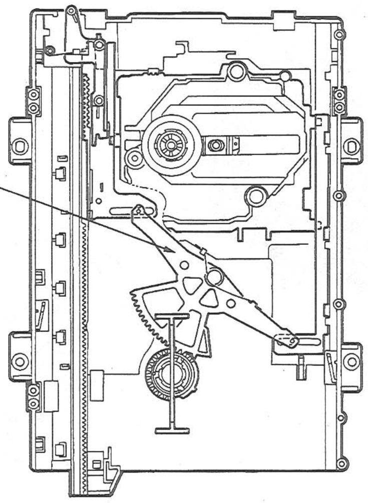

Lock lever (L)

Step 10 Pull the lock lever (L) in the direction of arrow (➡).

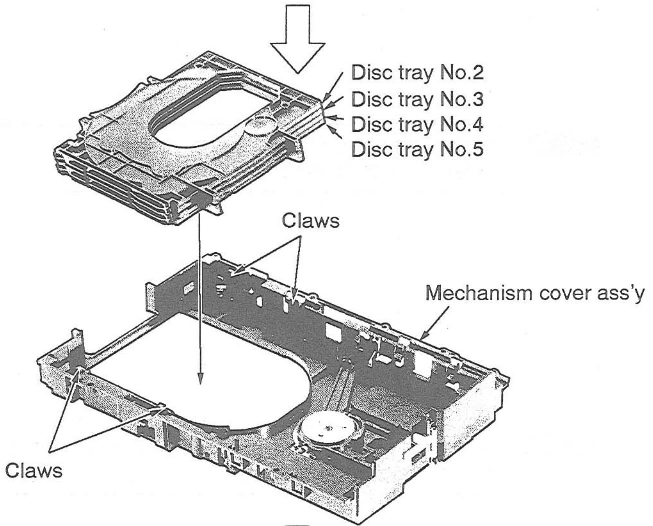

① Release the lock lever manually.
Traverse unit
② Rotate the conversion lever manually.

〈"DOWN"stated〉

After assembly, confirm the traverse unit operation.

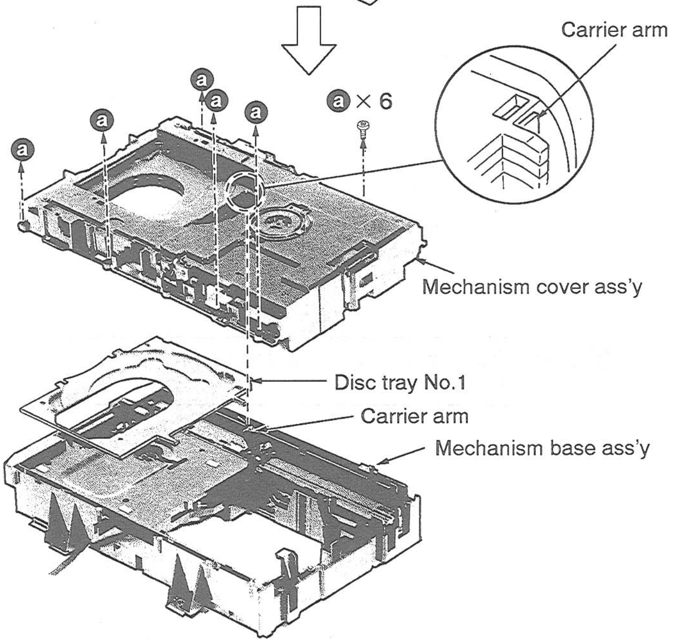


〈"UP"stated〉


Disc tray No.2
Disc tray No.3
Disc tray No.4
Disc tray No.5
Claws
Mechanism cover ass'y
Claws

Step 11 Install the 4 disc trays to the mechanism cover ass'y. (Allow them to lock with claws.)

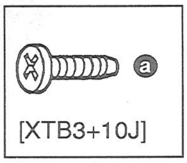
(!) Install the disc trays in specific order. (Disc tray No. is indicated on the tray.)


Carrier arm
ⓐ × 6
ⓐ
ⓐ
ⓐ
ⓐ
ⓐ
ⓐ
Mechanism cover ass'y
Disc tray No.1
Carrier arm
Mechanism base ass'y

Step 12 Place the disc tray No.1 on the mechanism base ass'y.

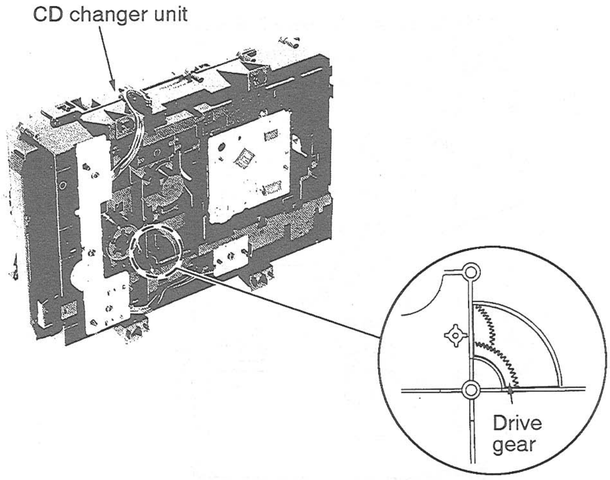
Step 13 Install the mechanism cover ass'y.

(!) The carrier arm is positioned as shown left.



Inspection for CD changer unit

- Begin the inspections in condition that the traverse is kept from disc tray. (5 disc trays in the store compartment.)


CD changer unit
Drive gear

※ Manual operations

① Rotate the drive gear counterclockwise manually.

The traverse runs over the disc tray, and rises at maximum level.

② Rotate the drive gear clockwise manually.

The disc tray moves and is stored in upper compartment.

The tray base is open.

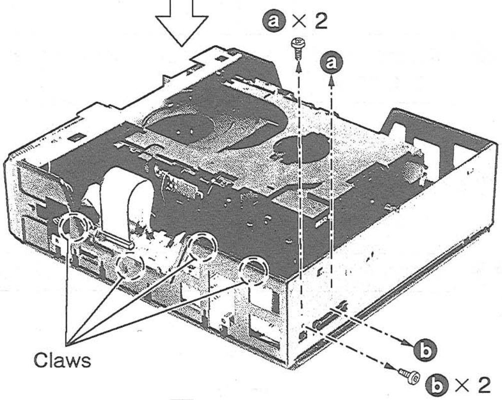
③ Again rotate the drive gear counterclockwise manually.

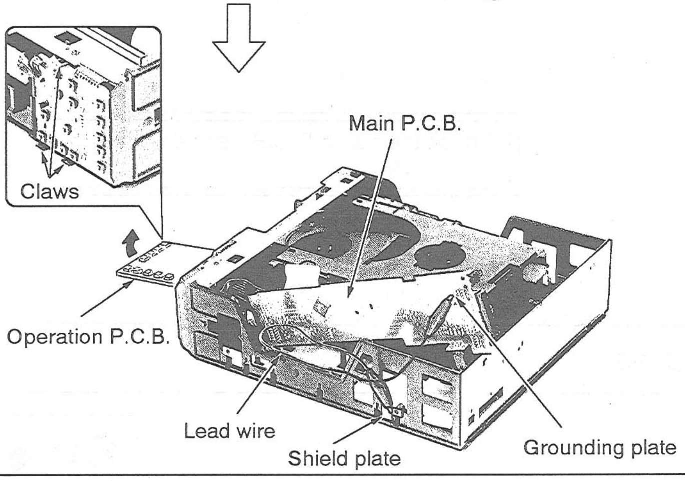
The tray base is closed, and then it returns to start position.

Main Component Replacement Procedures

Checking for the main P.C.B. and the operation P.C.B.

Perform the items Step 1 and Step 2 for CD changer removal
(Refer to page 5.)




Claws
Main P.C.B.
Operation P.C.B.
Lead wire
Shield plate
Grounding plate

Main P.C.B.

Step 1 Remove the 4 screws.

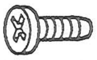
Step 2 Release the 4 claws, and then stand the main P.C.B..

Step 3 Connect the lead wire between the grounding plate and shield plate.

Operatiom P.C.B.

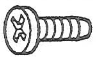
Step 1 Release the 3 claws, and then upset the operation P.C.B..

Check the main P.C.B. (solder side) and the operation P.C.B. (solder side) as shown left.



ⓐ (Black)

[XTB3+8JFZ]



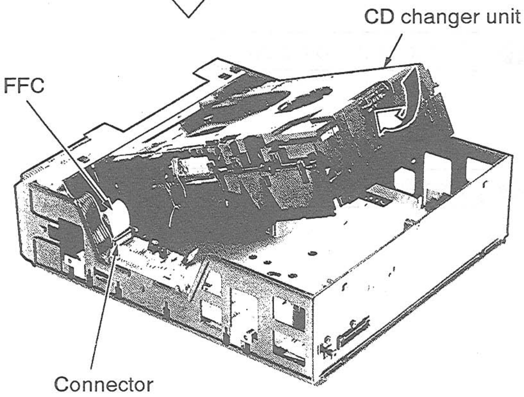
ⓑ (Black)

[XTBS3+8JFZ1]

Checking for the servo P.C.B.

Perform the items Step 1 ~ Step 6 for CD changer removal
(Refer to pages 5 and 6.)

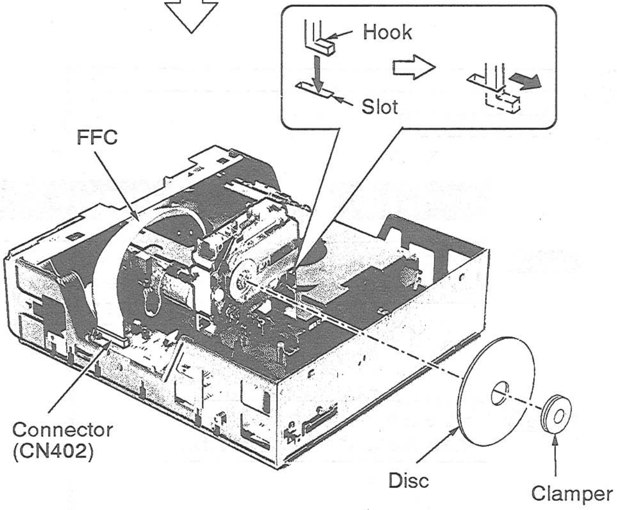
Perform the items Step 1 ~ Step 4 for traverse unit removal
(Refer to page 6.)


CD changer unit
FFC
Connector

Step 1 Install the CD changer unit to the set.

ⓘ Screw tighten is not necessary.

Step 2 Connect the FFC to the connector (CN401).

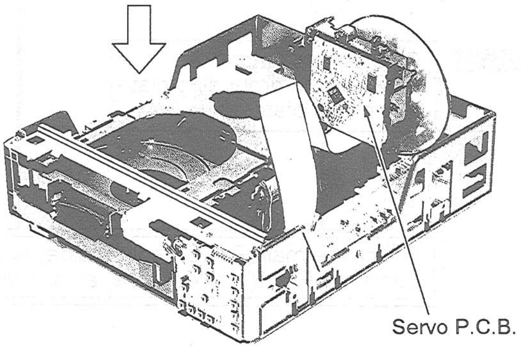

Hook
Slot
FFC
Connector
(CN402)
Disc
Clamper

Step 3 Align the hook of traverse unit with the slot, and then stand it.

Step 4 Attach the disc and clamper with magnet to the traverse unit.

ⓘ Prepare the clamper used ordinaly.

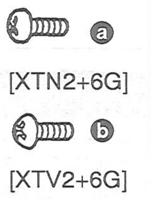
Step 5 Connect the FFC to the connector (CN402).



Check the servo P.C.B. (solder side) as shown left.

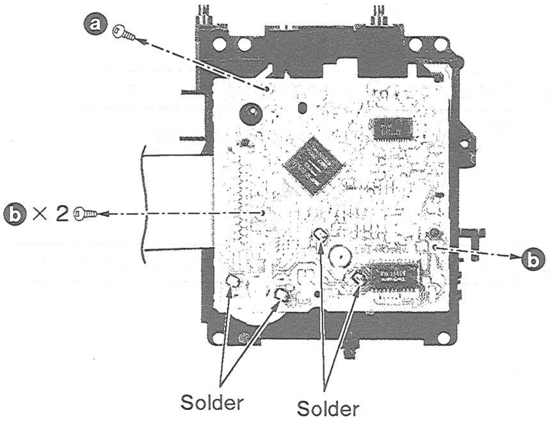
Main Component Replacement Procedures

Replacement for the traverse deck ass'y


ⓐ
[XTN2+6G]
ⓑ
[XTV2+6G]

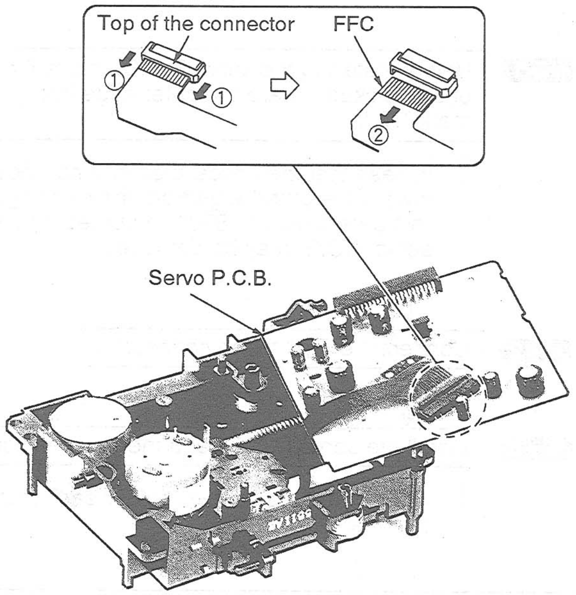
Perform the items **Step 1** ~ **Step 6** for CD changer removal
(Refer to pages 5 and 6.)

Perform the items **Step 1** ~ **Step 4** for traverse unit removal
(Refer to page 7.)


ⓐ
ⓑ × 2
ⓑ
Solder
Solder

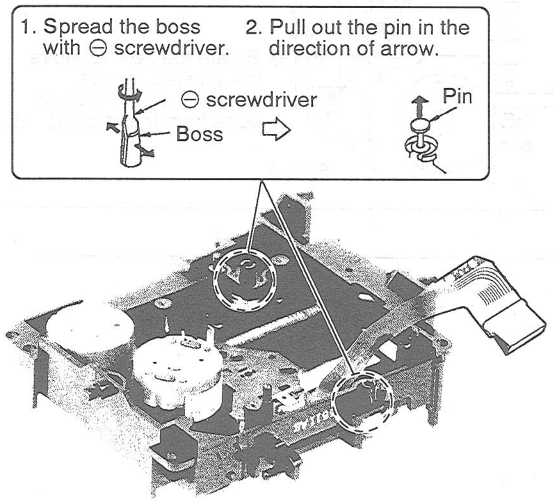
Step 1 Remove the 3 screws.

Step 2 Unsolder the motor terminals.

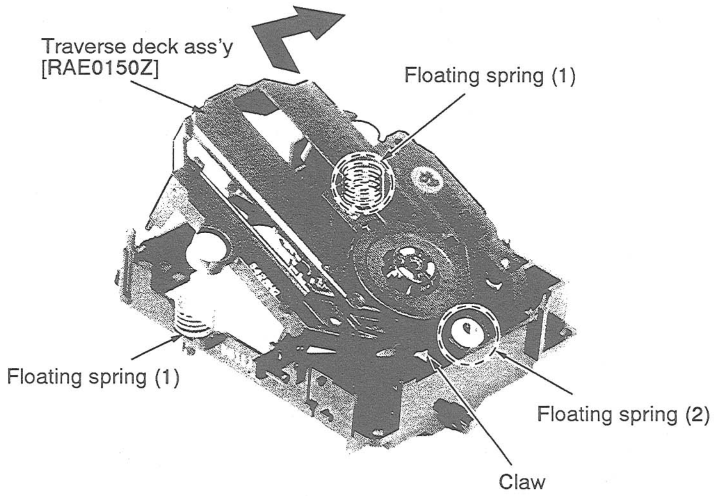

Top of the connector
FFC
①
①
②
Servo P.C.B.

Step 3 Remove the FFC from the connector, and then remove the servo P.C.B..

ⓘ Solder the point between pin 4 (LD) and pin 5 (GND) of FFC.
(Refer to "Handling Precautions for Traverse Deck" on page 4).


1. Spread the boss with ⊖ screwdriver.
2. Pull out the pin in the direction of arrow.
⊖ screwdriver
Boss
Pin

Step 4 Remove the pins.


Traverse deck ass'y [RAE0150Z]
Floating spring (1)
Floating spring (1)
Floating spring (2)
Claw

Step 5 Release the claws, and then remove the traverse deck ass'y.

ⓘ Be careful not to lose the 3 springs because those will also be removed on removal of the traverse deck ass'y.

Installation of the servo P.C.B.

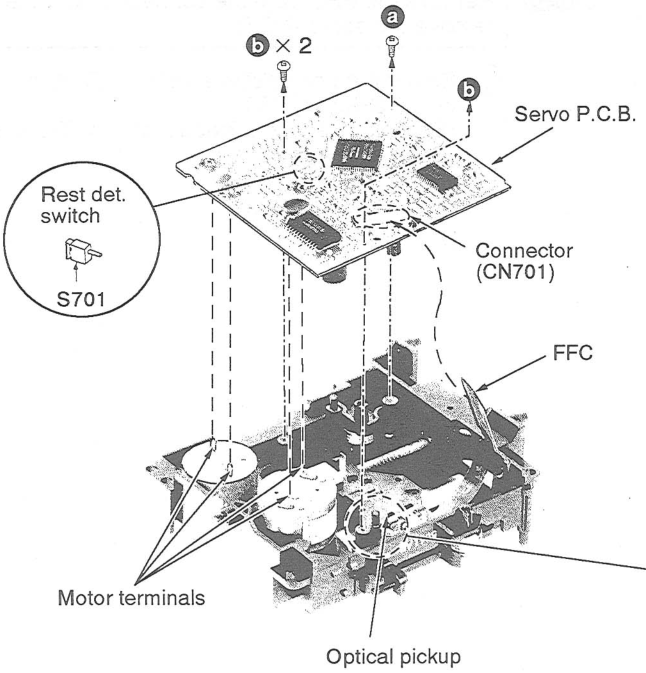
Step 1 Before installing the servo P.C.B., move the optical pickup toward the outer edge from mark "▼".

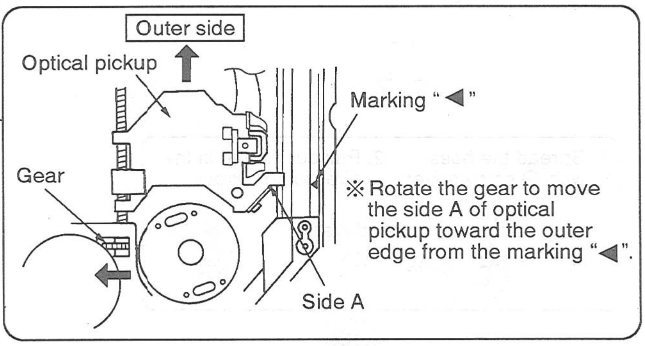
(!) In case that the optical pickup is not moved toward the outer edge from the marking, the rest detect switch (S701) mounted on the servo P.C.B. may be damaged.

Step 2 Connect the FFC to the connector.

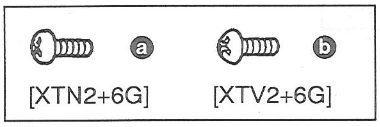
Step 3 Install the servo P.C.B., and then tighten screws.

(!) After tightening screws, solder each motor terminal.


ⓑ × 2
ⓐ
ⓑ
Servo P.C.B.
Rest det. switch
S701
Connector (CN701)
FFC
Motor terminals
Optical pickup


Outer side
Optical pickup
Marking "◀"
Gear
Side A

※ Rotate the gear to move the side A of optical pickup toward the outer edge from the marking "◀".


ⓐ
ⓑ
[XTN2+6G]
[XTV2+6G]

ERROR CODE DISPLAY AND SERVO ADJUSTMENT FUNCTION

This unit has an error code display function, so that if the unit operates incorrectly, the fault is displayed using an error code on the FL display of the tuner (ST-CA10). It also has a servo adjustment function for displaying the status of servo system functions (focus, tracking, CLV) on the tuner's FL display.
The system control IC and FL display are part of the tuner so make sure the system has been connected properly before using these functions.
(This unit can be operated independently, although the error code display and servo adjustment functions cannot be used.)
Use these two functions for guidance during fault diagnosis and repair.

Note: Check beforehand for scratching or soiling of the test disc (SZZP1054C), and soiling or other problems with the optical pickup lens.

● Error code display procedure

Automatic adjustment results

Turn power ON.

↓

Load the test disc (SZZP1054C).

↓

Hold down the REPEAT button for at least 2 seconds, and then press the STOP button for at least 2 seconds while continuing to hold down the REPEAT button.

↓

A servo section error code is displayed. (See **Table 2.**) Use this error code display as a guideline for finding the malfunction point in the servo circuitry. If the error code **"E-00"** is displayed, the unit is "OK (No problem)."

↓

Checking the mechanism switches

Press the F. SKIP button.

↓

A mechanism OK/NG error code is displayed. (See **Table 1.**) This error code can be used to diagnose whether or not the mechanism is OK. If there are multiple errors, these can be displayed successively by pressing the F. SKIP button.

↓

Remove the disc and turn the power OFF. (The error code display mode is canceled.)

● Servo adjustment procedure

Turn the power ON.

↓

Load the test disc (SZZP1054C)

↓

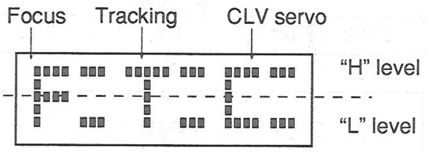
Hold down the REPEAT button for at least 2 seconds, then press the PAUSE button for at least 2 seconds while holding down the REPEAT button.

↓

Press the ▷ (PLAY) button, and play for 10 seconds

↓

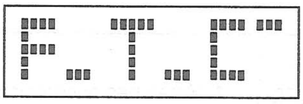
Servo adjustment results are displayed



↓

Remove the disc and turn the power OFF.

(Example)



	"L" level	"H" level
Focus	Focus system normal	Focus system defective
Tracking	Tracking system normal	Tracking system defective
CLV servo	CLV servo system defective	CLV servo system normal

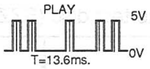
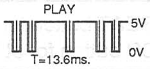
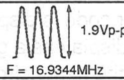
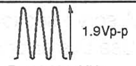
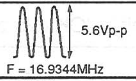
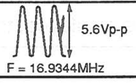
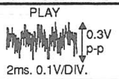
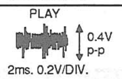
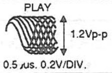
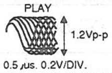
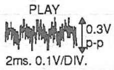
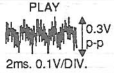
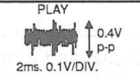
● Table 1

FL display	Symptom	Cause
H - 15	When CD tray opens, it closes by itself.	Disc tray "Open" detection switch (S4) fault.
H - 16	When CD tray closes, it opens by itself	Disc tray "Closed" detection switch (S4) fault.
F - 15	Does not play, even when CD play button is pressed.	Pickup rest position detection switch (S701) fault.
F - 16	Traverse pushes up disc tray.	Up position detection switch (S3) fault.
F - 26	Does not move even when "▷ " (PLAY) is pressed.	System control or servo processor IC (IC401, 702) fault.
F - 27	Tray keeps moving for a while, or selected tray does not open.	Disc number detection switch (S5) fault.
F - 28		Stocker position detection, or play position detection switch (S1, S2) fault.
F - 75	"NO DISC" is displayed and unit does not play, even when a CD is loaded.	CD circuit power supply problem.

● Table 2

※ The unit is satisfactory if the error code is **E - 00** of **E - 02**

※ Before testing, check that the test disc is free of scratches and optical pickup is clean.

FL error code display	Symptom	Probable cause	Signal to check		Normal voltage and waveform values	
			Signal name	Location	PLAY	STOP
E - 01	Focus and tracking offset adjustments not completed in the specified time period.	1. Clocks X1 and X2, power supply V_{DD} and reset/RST, all on IC702. 2. MDATA, MCLK, MLD and SENSE signal to/from mechanism controller.	MDATA	IC702 ⑧ pin		0V
			MCLK	IC702 ⑦ pin		4.8V
			MLD	IC702 ⑨ pin		
			SENSE	IC702 ⑩ pin	0V	0V
			/RST	IC702 ⑱ pin	4.9V	4.9V
			X1	IC702 (58) pin		
			X2	IC702 (59) pin		
E - 03 **E - 05** **E - 07** **E - 09** **E - 0B** **E - 0D** **E - 0F**	Disc play unstable.	1. Scratches or contaminants on disc surface. 2. Focus and tracking servo circuits (check waveforms, voltages, and part values.) 3. Spindle driver circuit. 4. Optical pickup.	FE	IC702 ㉜ pin		2.5V
			TE	IC702 ㉝ pin		2.5V
			FOD	IC702 ㉘ pin	2.5V	2.5V
			TRD	IC702 ㉗ pin	2.5V	2.5V
			KICK	IC702 ㉖ pin	2.5V	2.5V
			/FLOCK	IC702 ⑪ pin	0V	4.9V
			/RF DET	IC702 ㊳ pin	0V	4.9V
			RF	TJ701		3.4V
			STAT	IC702 ⑰ pin	4.9V	0V
E - 04 **E - 06** **E - 0C** **E - 0E**	Best "Eye" (PD Balance) adjustment not completed in the specified time period.	1. Scratches or contaminants on disc surface. 2. Focus and Tracking servo circuit (check waveforms, voltages, and part values.) 3. Optical pickup.	FBAL	IC702 ㉚ pin	2.5 ±1.25V	2.5 ±1.25V
			RF	TJ701		3.4V
			FE	IC702 ㉜ pin		2.5V
			/TLOCK	IC702 ⑫ pin	0V	0V
			OFT	IC702 ㊱ pin	0V	0V
E - 08 **E - 0A**	Focus or Tracking gain adjustment not completed in the specified time period.	1. Scratches or contaminants on disc surface. 2. Focus and Tracking servo circuit (check waveforms, voltages, and part values.) 3. Optical pickup.	FE	IC702 ㉜ pin		2.5V
			TE	IC702 ㉝ pin		2.5V
			/TLOCK	IC702 ⑫ pin	0V	0V
			OFT	IC702 ㊱ pin	0V	0V

MEASUREMENTS AND ADJUSTMENTS

Cautions:

- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.) With the unit turned "on", laser radiation is emitted from the pickup lens.
- Avoid exposure to the laser beam, especially when performing adjustments.

This unit SL-CA10 is designed to operate on power supplied from the Amplifier SE-CA10 through the Tuner ST-CA10.
When connecting the unit to other system components, do not connect to the Amplifier SE-CA10 directly. Be sure to connect this unit through the Tuner ST-CA10.
When operating the unit SL-CA10 alone for testing and servicing, without having power supplied from the Amplifier SE-CA10 and the Tuner ST-CA10, use the following method.

Power Supply to This Unit alone

1. Short-circuit the section between jumper (J13) and jumper (J14) [TEST MODE].
2. Apply 11V AC power to the section between AC of the coil (L1) and the jumper (J3) GND as well as the section between AC of the coil (L2) and the jumper (J3) GND. **(Shown in Fig. 1)**

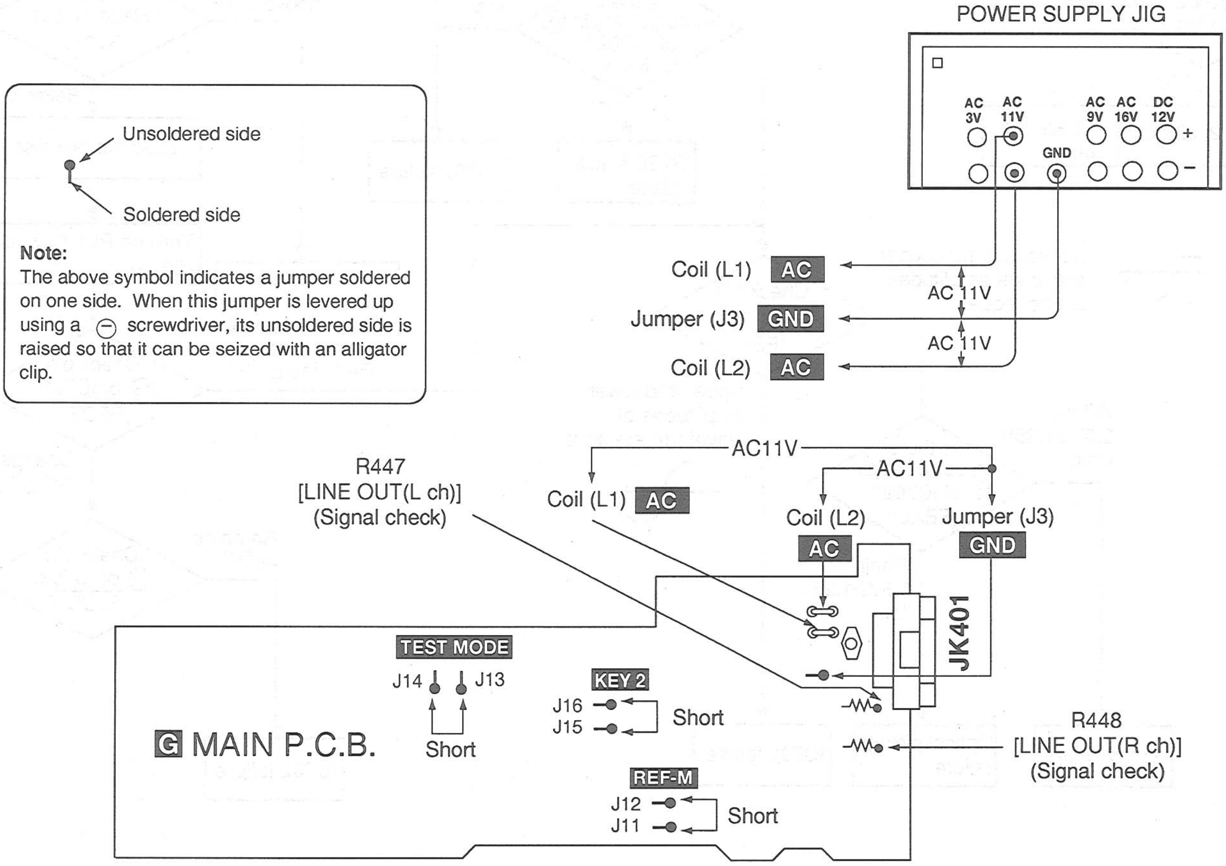
Operating the Unit Alone

When this unit is operated alone without system connection to other units, the switches on the front panel remain inoperative. To operate the switches, follow the procedure below.

1. Short-circuit the points between the jumper (J11), the jumper (J12) and the [REF-M].
2. Short-circuit the points between the jumper (J15), the jumper (J16) and the [KEY2].

To Check Signals

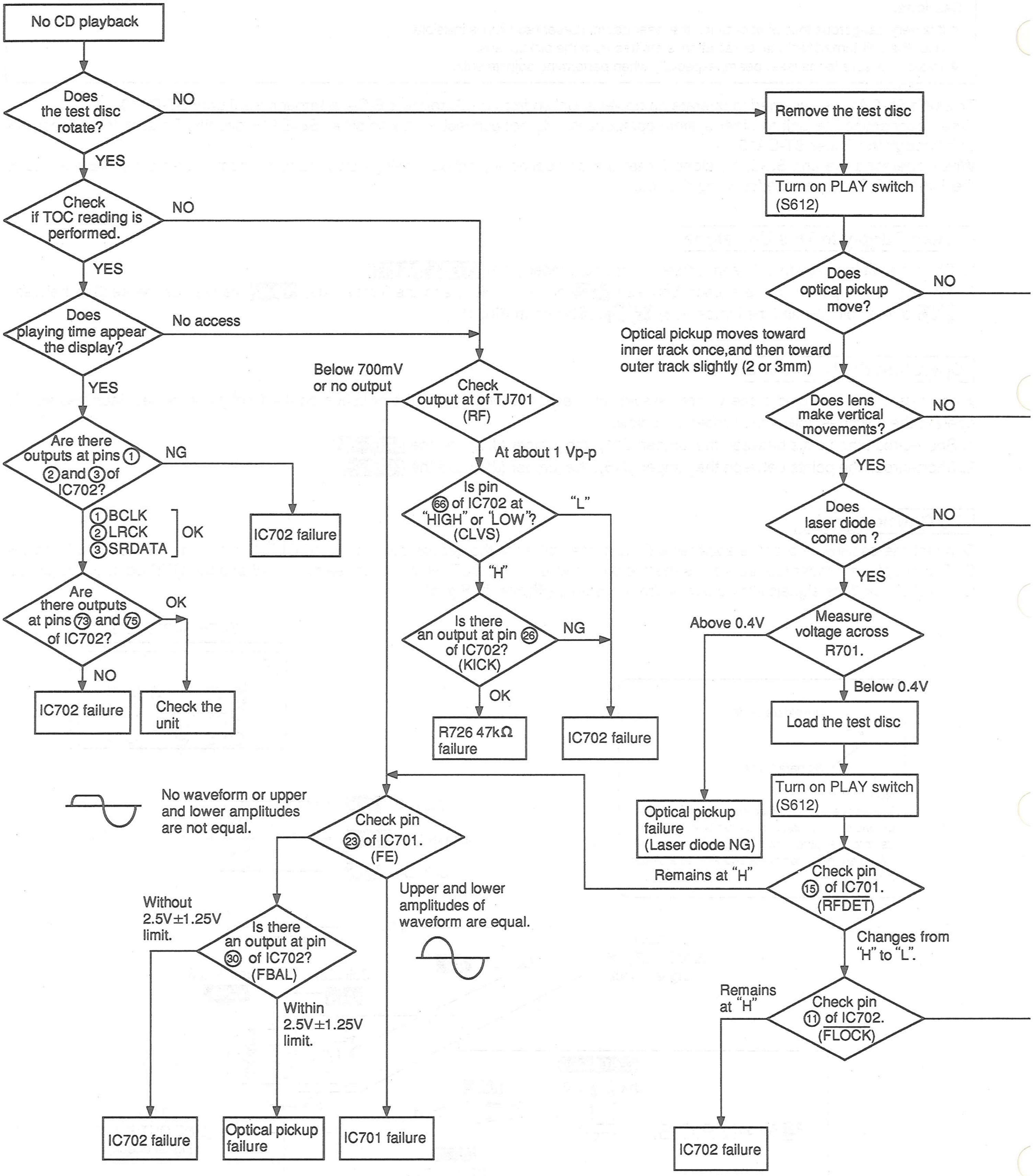
Connect the oscilloscope or the speaker with built-in amplifier to the section between LINE OUT (Lch) of the resistor R447 and the GND point of the jumper (J3) as well as the section between LINE OUT (R ch) of the resistor R448 and the GND point of the jumper (J3) and check if the signals are outputting from this unit. **(Shown in Fig. 1)**

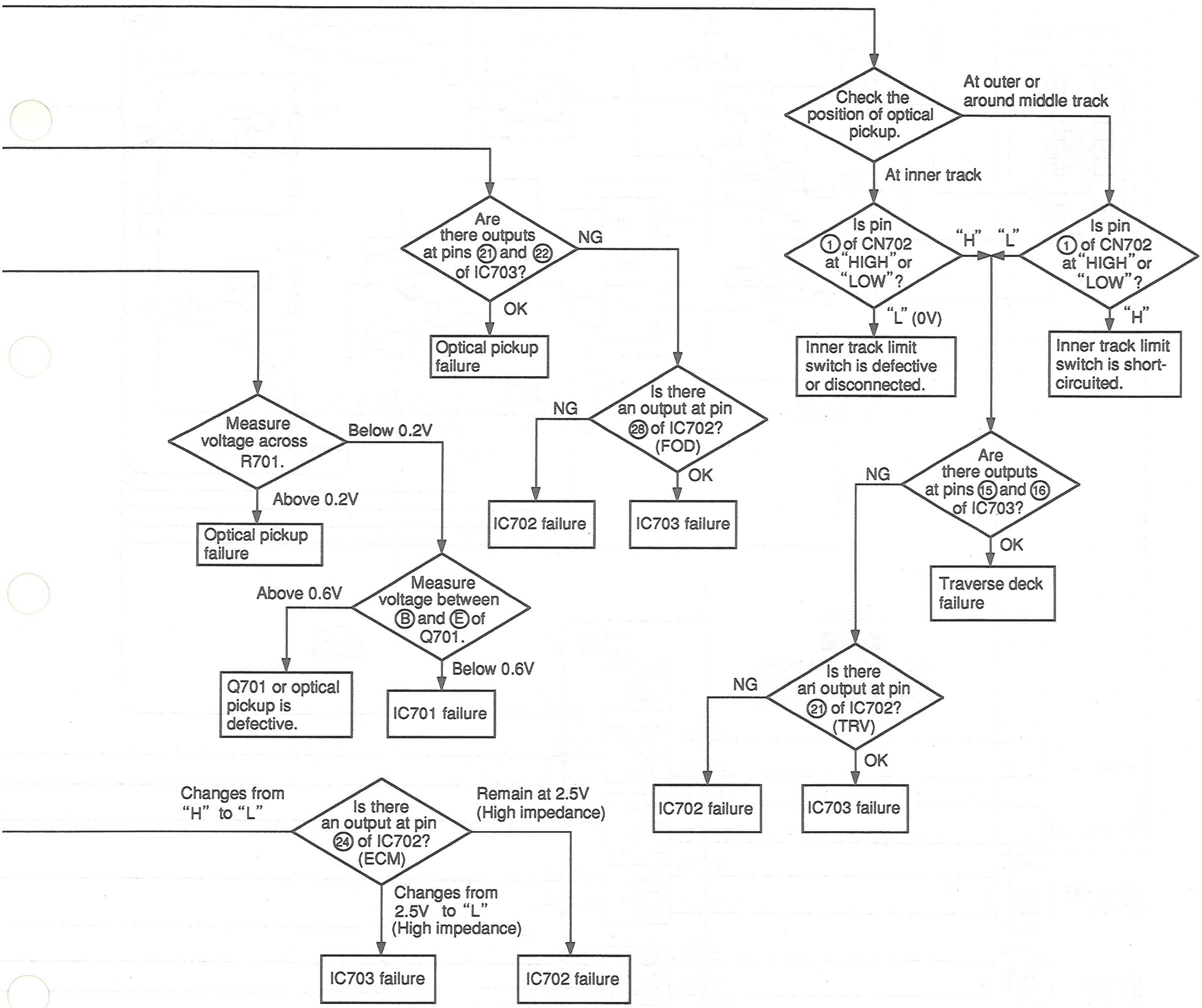

POWER SUPPLY JIG
AC 3V
AC 11V
AC 9V
AC 16V
DC 12V
+
GND
−
Coil (L1) AC
AC 11V
Jumper (J3) GND
AC 11V
Coil (L2) AC
Unsoldered side
Soldered side
AC11V
AC11V
R447
[LINE OUT(L ch)]
(Signal check)
Coil (L1) AC
Coil (L2) AC
Jumper (J3) GND
JK401
TEST MODE
J14
J13
Short
KEY 2
J16
J15
Short
G MAIN P.C.B.
REF-M
J12
J11
Short
R448
[LINE OUT(R ch)]
(Signal check)

Note:
The above symbol indicates a jumper soldered on one side. When this jumper is levered up using a ⊖ screwdriver, its unsoldered side is raised so that it can be seized with an alligator clip.

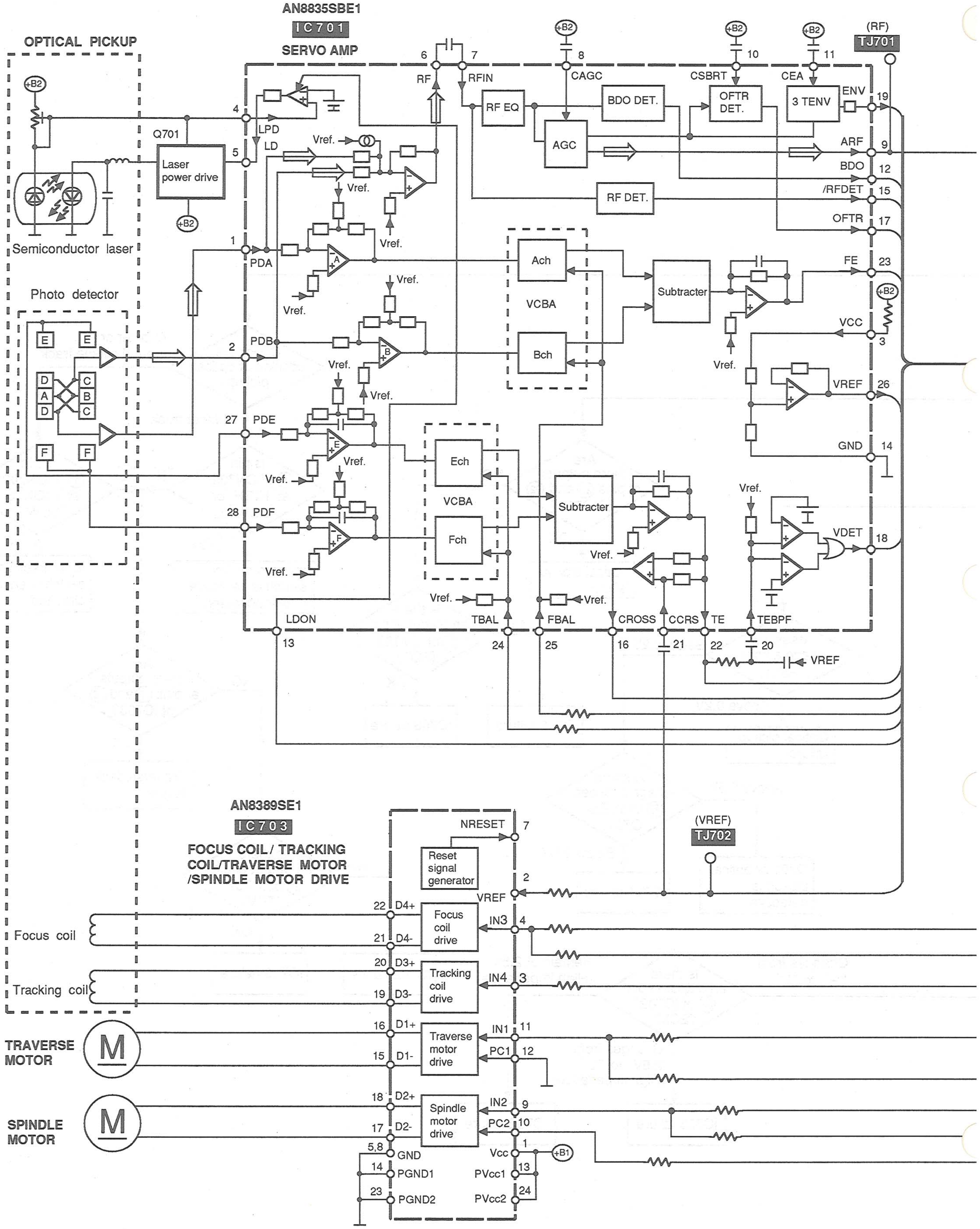
Fig. 1

■TROUBLE SHOOTING (SERVO CIRCUIT)


No CD playback
Does the test disc rotate?
NO
YES
Remove the test disc
Turn on PLAY switch (S612)
Check if TOC reading is performed.
NO
YES
Does optical pickup move?
NO
Does playing time appear the display?
No access
YES
Optical pickup moves toward inner track once,and then toward outer track slightly (2 or 3mm)
Below 700mV or no output
Check output at of TJ701 (RF)
Does lens make vertical movements?
NO
YES
Are there outputs at pins ① ②and③of IC702?
NG
IC702 failure
At about 1 Vp-p
Is pin ⑯ of IC702 at "HIGH" or "LOW"? (CLVS)
"L"
Does laser diode come on ?
NO
YES
①BCLK
②LRCK
③SRDATA
OK
"H"
Are there outputs at pins ㊸ and ㊺ of IC702?
OK
Is there an output at pin ㉖ of IC702? (KICK)
NG
Above 0.4V
Measure voltage across R701.
NO
IC702 failure
Check the unit
OK
R726 47kΩ failure
IC702 failure
Below 0.4V
Load the test disc
Turn on PLAY switch (S612)
No waveform or upper and lower amplitudes are not equal.
Check pin ㉓ of IC701. (FE)
Optical pickup failure (Laser diode NG)
Remains at "H"
Check pin ⑮ of IC701. (RFDET)
Without 2.5V±1.25V limit.
Is there an output at pin ㉚ of IC702? (FBAL)
Upper and lower amplitudes of waveform are equal.
Changes from "H" to "L".
Within 2.5V±1.25V limit.
Remains at "H"
Check pin ⑪ of IC702. (FLOCK)
IC702 failure
Optical pickup failure
IC701 failure
IC702 failure


Check the position of optical pickup.
At outer or around middle track
At inner track
Is pin ① of CN702 at "HIGH" or "LOW"?
"H"
"L"
Is pin ① of CN702 at "HIGH" or "LOW"?
"L" (0V)
Inner track limit switch is defective or disconnected.
"H"
Inner track limit switch is short-circuited.
Are there outputs at pins ⑮ and ⑯ of IC703?
NG
OK
Traverse deck failure
Is there an output at pin ㉑ of IC702? (TRV)
NG
OK
IC702 failure
IC703 failure
Are there outputs at pins ㉑ and ㉒ of IC703?
NG
OK
Optical pickup failure
Is there an output at pin ㉘ of IC702? (FOD)
NG
OK
IC702 failure
IC703 failure
Measure voltage across R701.
Below 0.2V
Above 0.2V
Optical pickup failure
Measure voltage between Ⓑ and Ⓔ of Q701.
Above 0.6V
Below 0.6V
Q701 or optical pickup is defective.
IC701 failure
Is there an output at pin ㉔ of IC702? (ECM)
Changes from "H" to "L"
Remain at 2.5V (High impedance)
Changes from 2.5V to "L" (High impedance)
IC703 failure
IC702 failure

BLOCK DIAGRAM

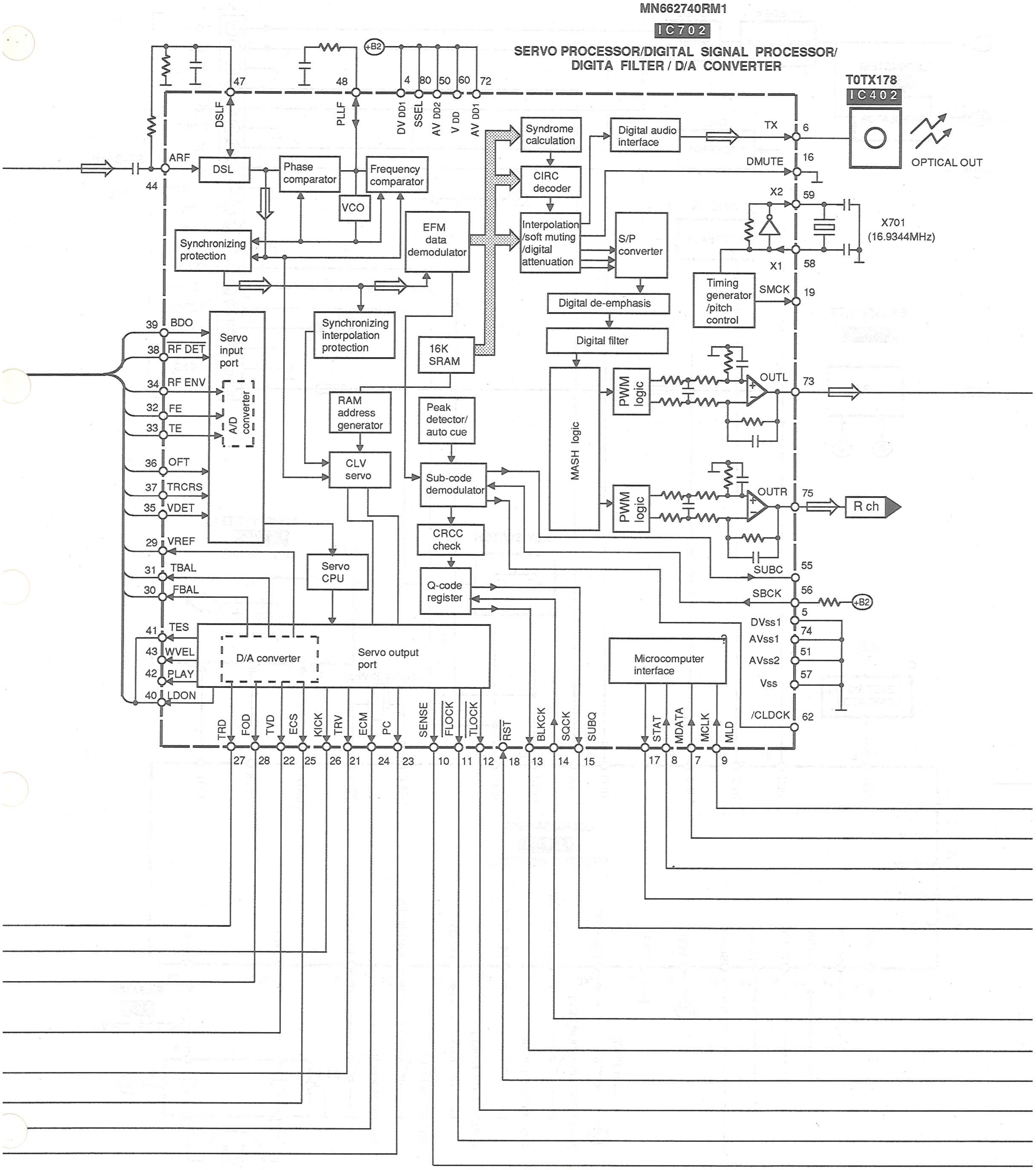

AN8835SBE1
IC701
SERVO AMP
OPTICAL PICKUP
+B2
Q701
Laser power drive
Semiconductor laser
Photo detector
E
D
A
C
B
F
LPD
LD
PDA
PDB
PDE
PDF
Vref.
RF
RFIN
CAGC
CSBRT
CEA
RF EQ
AGC
BDO DET.
OFTR DET.
3 TENV
ENV
ARF
BDO
/RFDET
OFTR
RF DET.
Ach
Bch
VCBA
Ech
Fch
Subtracter
FE
VCC
VREF
GND
VDET
LDON
TBAL
FBAL
CROSS
CCRS
TE
TEBPF
(RF)
TJ701
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
AN8389SE1
IC703
FOCUS COIL / TRACKING COIL/TRAVERSE MOTOR /SPINDLE MOTOR DRIVE
(VREF)
TJ702
NRESET
Reset signal generator
VREF
Focus coil drive
Tracking coil drive
Traverse motor drive
Spindle motor drive
D4+
D4-
D3+
D3-
D1+
D1-
D2+
D2-
IN3
IN4
IN1
PC1
IN2
PC2
Vcc
PVcc1
PVcc2
GND
PGND1
PGND2
5,8
+B1
Focus coil
Tracking coil
TRAVERSE MOTOR
SPINDLE MOTOR
M

● Signal line ⇒ : CD signal

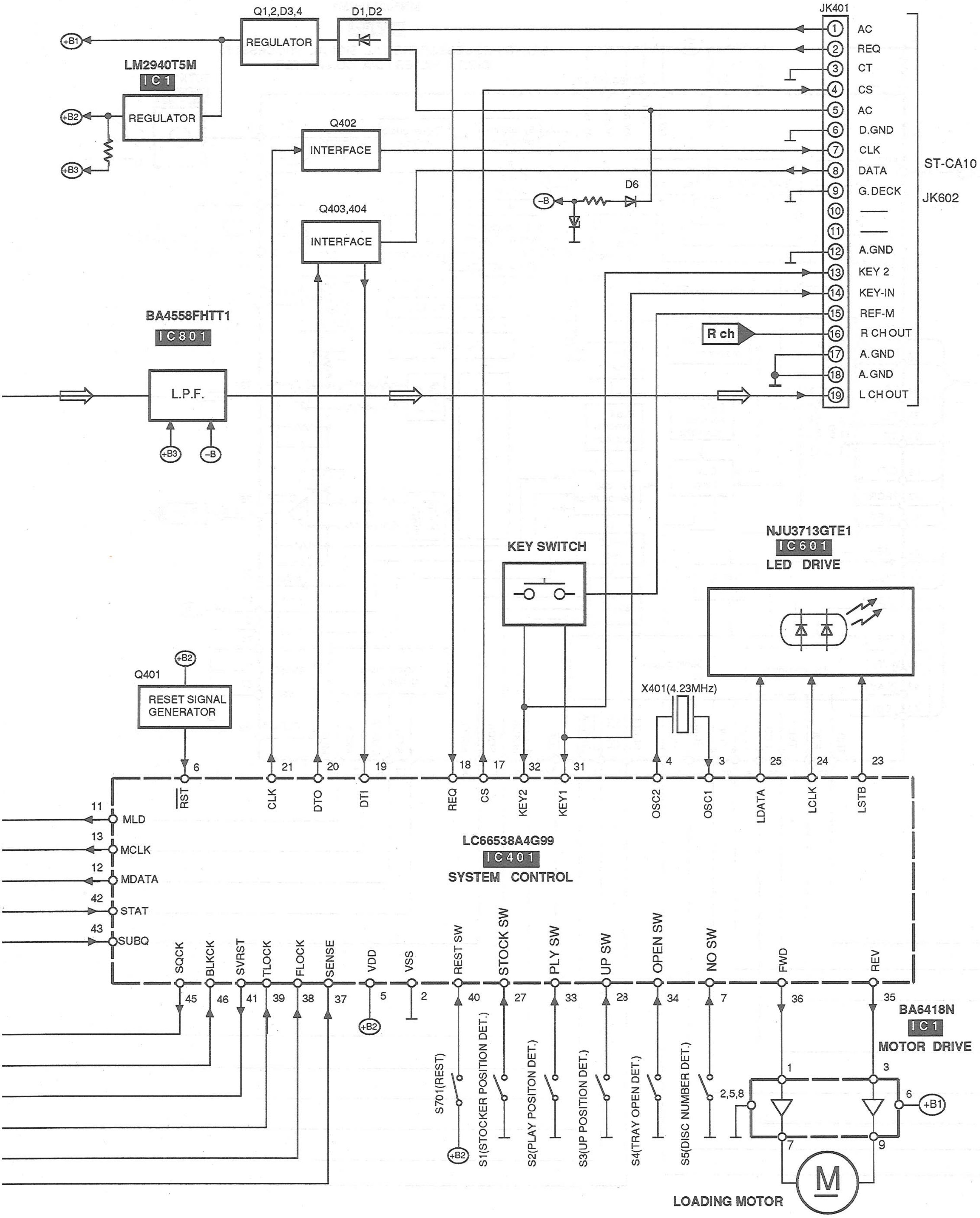
MN662740RM1

IC702

SERVO PROCESSOR/DIGITAL SIGNAL PROCESSOR/ DIGITA FILTER / D/A CONVERTER


+B2
47
48
4
80
50
60
72
DSLF
PLLF
DV DD1
SSEL
AV DD2
V DD
AV DD1
T0TX178
IC402
OPTICAL OUT
ARF
44
DSL
Phase comparator
Frequency comparator
VCO
Synchronizing protection
EFM data demodulator
Syndrome calculation
CIRC decoder
Interpolation /soft muting /digital attenuation
Digital audio interface
TX
6
DMUTE
16
X2
59
X701 (16.9344MHz)
X1
58
S/P converter
Timing generator /pitch control
SMCK
19
Digital de-emphasis
Digital filter
39 BDO
38 RF DET
34 RF ENV
32 FE
33 TE
36 OFT
37 TRCRS
35 VDET
29 VREF
31 TBAL
30 FBAL
41 TES
43 WVEL
42 PLAY
40 LDON
Servo input port
A/D converter
Synchronizing interpolation protection
16K SRAM
RAM address generator
Peak detector/ auto cue
CLV servo
Sub-code demodulator
CRCC check
Q-code register
Servo CPU
MASH logic
PWM logic
PWM logic
OUTL
73
OUTR
75
R ch
SUBC
55
SBCK
56
+B2
5
DVss1
74
AVss1
51
AVss2
57
Vss
/CLDCK
62
D/A converter
Servo output port
Microcomputer interface
TRD 27
FOD 28
TVD 22
ECS 25
KICK 26
TRV 21
ECM 24
PC 23
SENSE 10
FLOCK 11
TLOCK 12
RST 18
BLKCK 13
SQCK 14
SUBQ 15
STAT 17
MDATA 8
MCLK 7
MLD 9

● Signal line ⇨ : CD signal


+B1
Q1,2,D3,4
REGULATOR
D1,D2
LM2940T5M
IC1
REGULATOR
+B2
+B3
Q402
INTERFACE
Q403,404
INTERFACE
D6
–B
JK401
1 AC
2 REQ
3 CT
4 CS
5 AC
6 D.GND
7 CLK
8 DATA
9 G.DECK
10
11
12 A.GND
13 KEY 2
14 KEY-IN
15 REF-M
16 R CH OUT
17 A.GND
18 A.GND
19 L CH OUT
ST-CA10
JK602
R ch
BA4558FHTT1
IC801
L.P.F.
+B3
–B
KEY SWITCH
NJU3713GTE1
IC601
LED DRIVE
Q401
+B2
RESET SIGNAL GENERATOR
X401(4.23MHz)
6 RST
21 CLK
20 DTO
19 DTI
18 REQ
17 CS
32 KEY2
31 KEY1
4 OSC2
3 OSC1
25 LDATA
24 LCLK
23 LSTB
11 MLD
13 MCLK
12 MDATA
42 STAT
43 SUBQ
LC66538A4G99
IC401
SYSTEM CONTROL
45 SQCK
46 BLKCK
41 SVRST
39 TLOCK
38 FLOCK
37 SENSE
5 VDD
+B2
2 VSS
40 REST SW
27 STOCK SW
33 PLY SW
28 UP SW
34 OPEN SW
7 NO SW
36 FWD
35 REV
S701(REST)
+B2
S1(STOCKER POSITION DET.)
S2(PLAY POSITON DET.)
S3(UP POSITION DET.)
S4(TRAY OPEN DET.)
S5(DISC NUMBER DET.)
BA6418N
IC1
MOTOR DRIVE
1
3
2,5,8
6
+B1
7
9
M
LOADING MOTOR

■SCHEMATIC DIAGRAM (Parts list on pages 37, 38, 41, 42.)

- This schematic diagram may be modified at any time with the development of new technology.

Page
A SERVO CIRCUIT 26, 27
B SWITCH CIRCUIT 28
C SWITCH (S2, S3) CIRCUIT 28
D LED CIRCUIT 28

Page
E LOADING MOTOR CIRCUIT 28
F OPERATION CIRCUIT 28
G MAIN CIRCUIT 28, 29

Notes:

- **S1** : Stocker position detect switch
- **S2** : Play position detect switch
- **S3** : Up position detect switch
- **S4** : Tray open detect switch
- **S5** : Disc number detect switch
- **S601**~**S605**: Disc select switch (DISC) [S601: DISC 5, S602: DISC 4, S603: DISC 3, S604: DISC 2, S605: DISC 1]
- **S606**: Disc check switch (DISC CHECK)
- **S607**: Repeat switch (REPEAT)
- **S608**: AI edit switch (AI EDIT)
- **S609**: Random play switch (RANDOM)
- **S610**: R. skip/ search switch (|◀◀/◀◀)
- **S611**: Stop switch (□)
- **S612**: Play switch (▷)
- **S613**: F. skip/ search switch (▶▶/▶▶|)
- **S614**: Pause switch: (▮▮)
- **S615**: Disc tray open/close switch (▲OPEN/CLOSE)
- **S701**: Rest detect switch
- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

  No mark: CD STOP
  (　　): CD play [1kHz, L+R, 0dB]

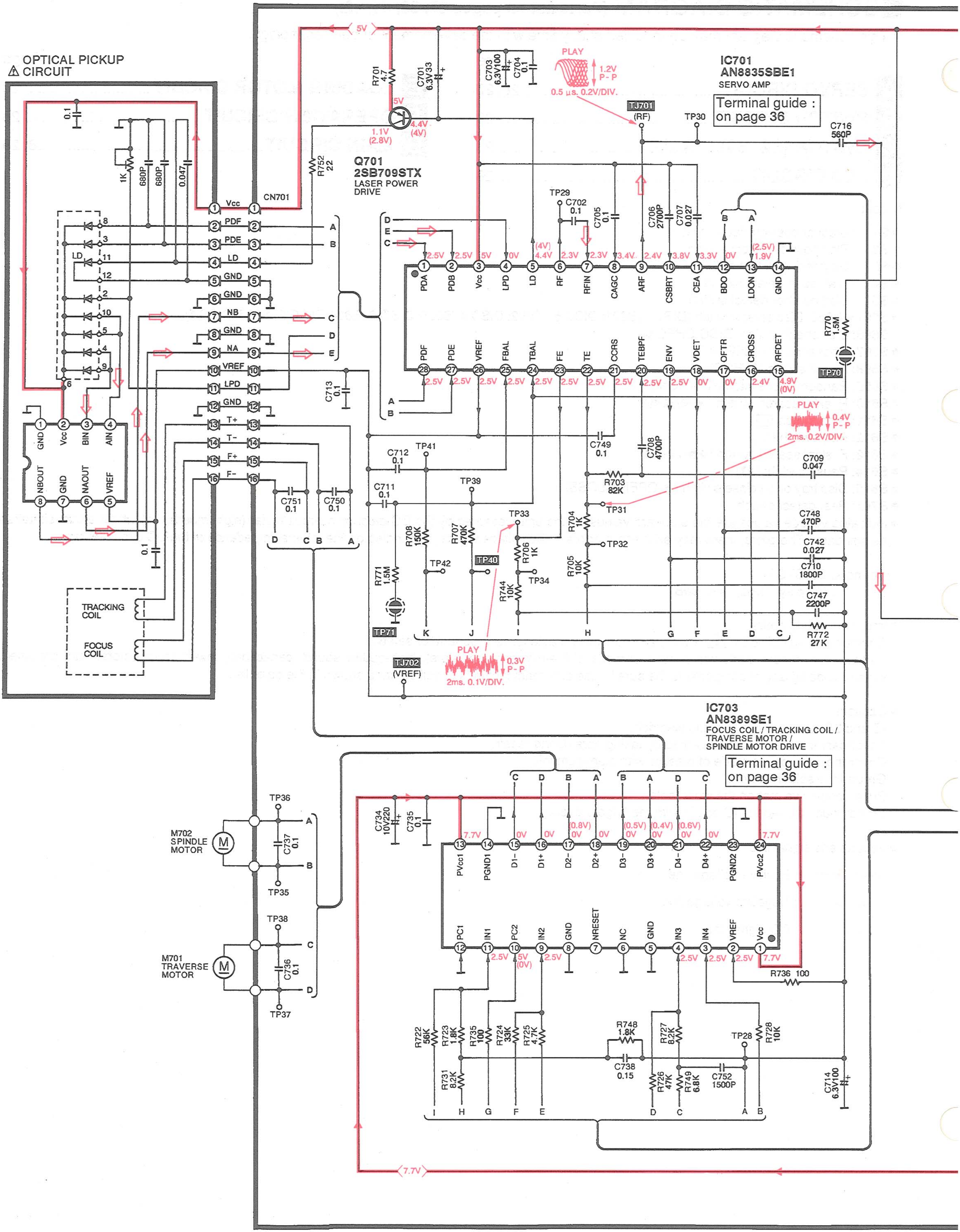
- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety.
  Furthermore, special parts which have purpose of fire-retardant (resistors), high-quality sound (capacitors), low-nose (resistors), etc. are used.
  When replacing any of components, be sure to use only manufacture's specified parts shown in the parts list.

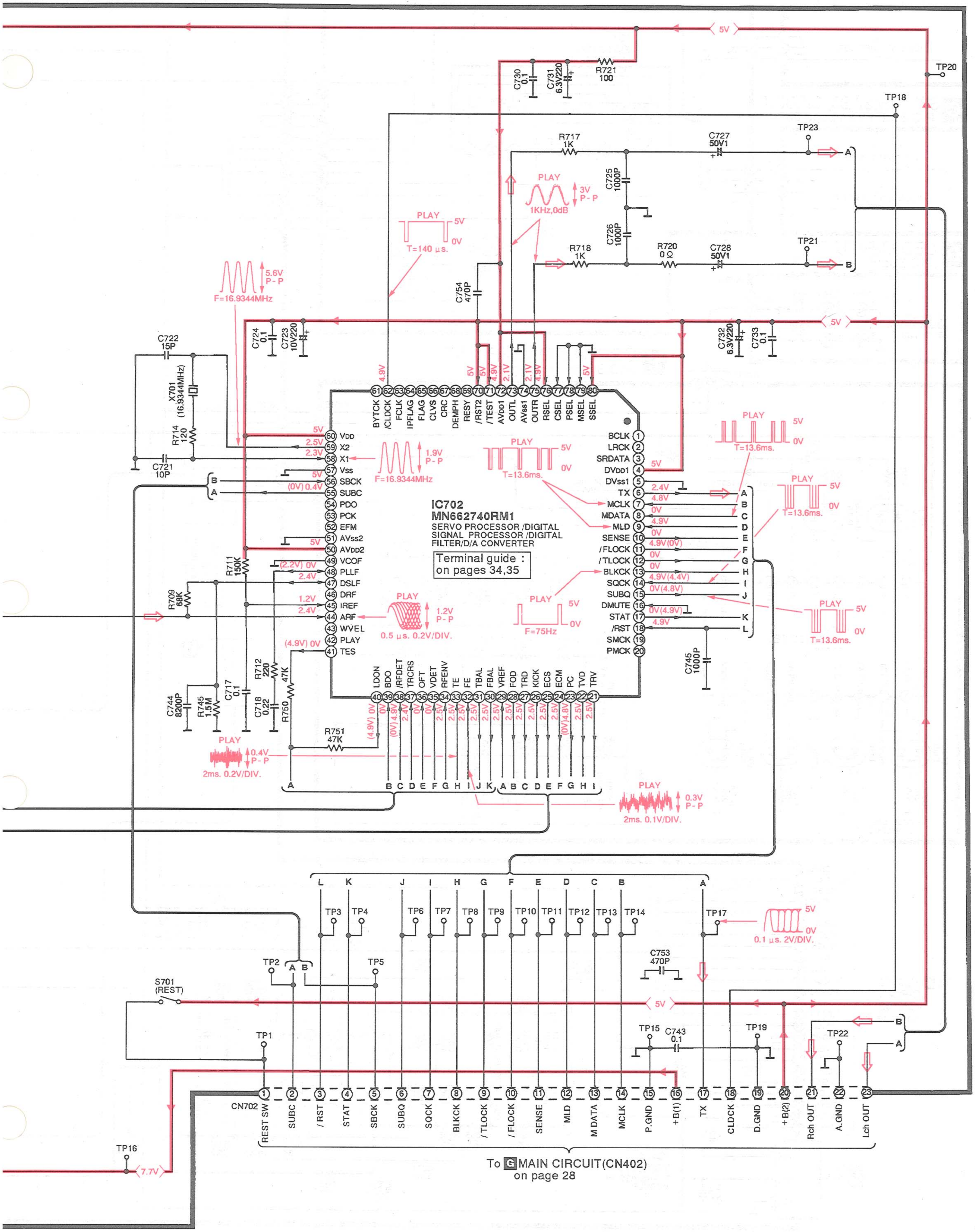
- Caution!
  IC and LSI are sensitive to static electricity.
  Secondary trouble can be prevented by taking care during repair.
  Cover the parts boxes made of plastics with aluminum foil.
  Ground the soldering iron.
  Put a conductive mat on the work table.
  Do not touch the legs of IC or LSI with the fingers directly.

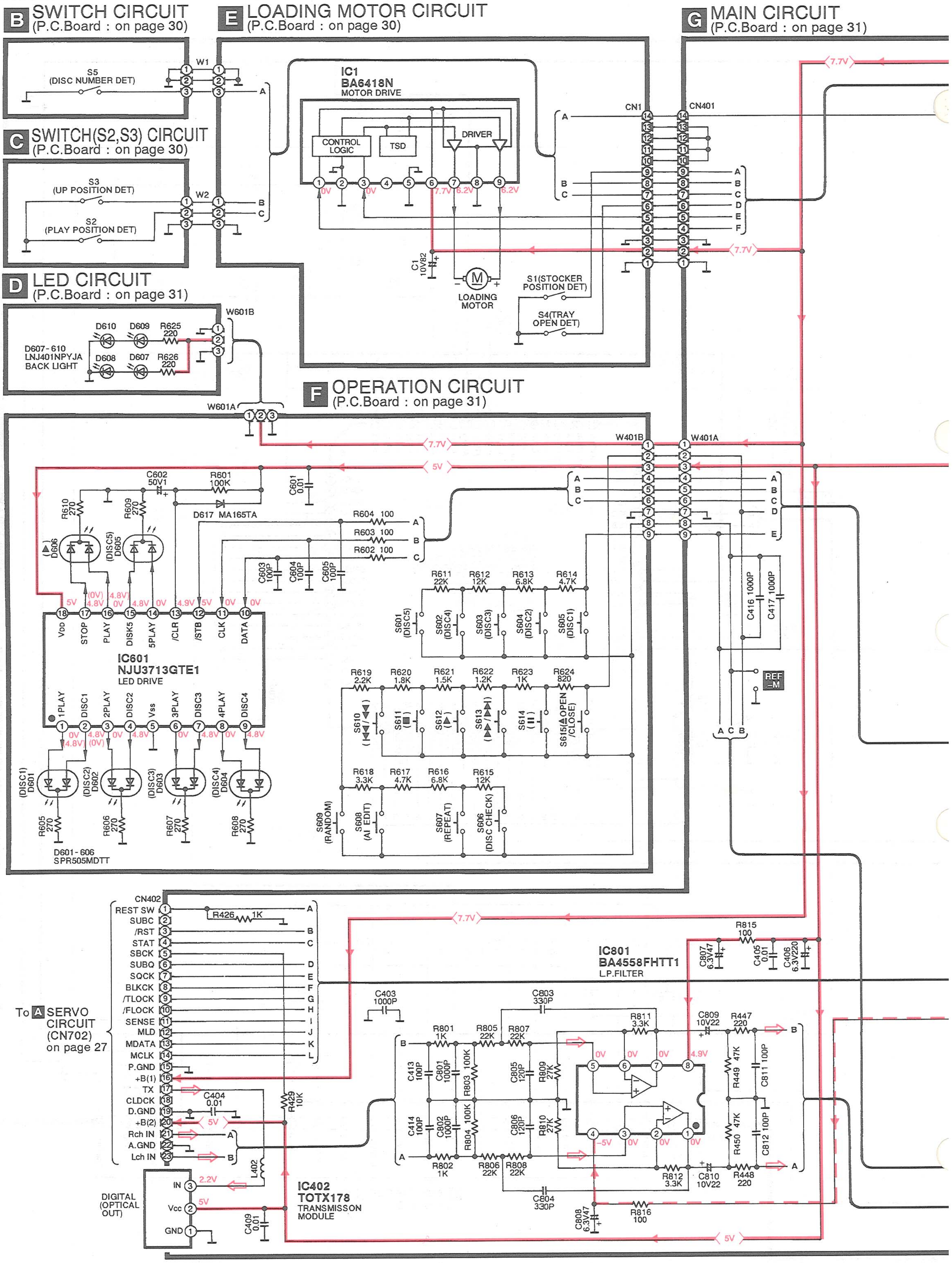
- Voltage and signal line

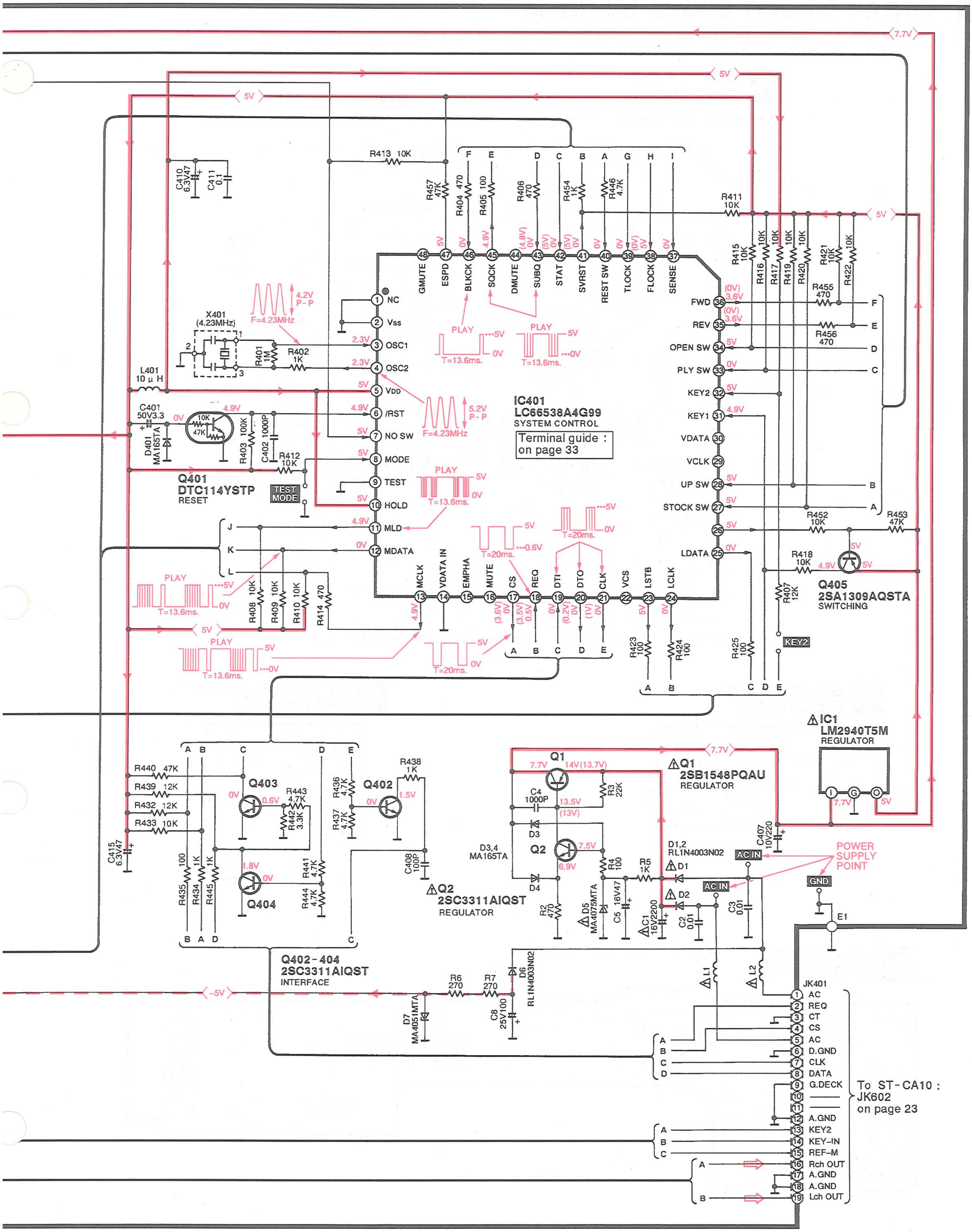
  ━━▶━━: Positive voltage line
  ▪▪▪▶▪▪▪: Negative voltage line
  ⇨ : CD signal line

A SERVO CIRCUIT
(P.C.Board : on page 30)


OPTICAL PICKUP
⚠ CIRCUIT
TRACKING COIL
FOCUS COIL
CN701
Vcc
PDF
PDE
LD
GND
NB
NA
VREF
LPD
T+
T-
F+
F-
GND
Vcc
BIN
AIN
NBOUT
NAOUT
VREF
Q701
2SB709STX
LASER POWER DRIVE
R701 4.7
C701 6.3V33
C703 6.3V100
C704 0.1
R752 22
5V
1.1V (2.8V)
4.4V (4V)
PLAY
1.2V P-P
0.5 μs. 0.2V/DIV.
TJ701 (RF)
TP30
TP29
IC701
AN8835SBE1
SERVO AMP
Terminal guide : on page 36
C716 560P
C702 0.1
C705 0.1
C706 2700P
C707 0.027
PDA
PDB
Vcc
LPD
LD
RF
RFIN
CAGC
ARF
CSBRT
CEA
BDO
LDON
GND
PDF
PDE
VREF
FBAL
TBAL
FE
TE
CCRS
TEBPF
ENV
VDET
OFTR
CROSS
RFDET
R770 1.5M
TP70
PLAY
0.4V P-P
2ms. 0.2V/DIV.
C713 0.1
C712 0.1
TP41
C711 0.1
TP39
C749 0.1
C708 4700P
C709 0.047
R703 82K
TP31
C748 470P
C742 0.027
C710 1800P
C747 2200P
R772 27K
R708 150K
R707 470K
TP33
R706 1K
R704 1K
TP32
R705 10K
TP42
TP40
TP34
R744 10K
R771 1.5M
TP71
PLAY
0.3V P-P
2ms. 0.1V/DIV.
TJ702 (VREF)
C751 0.1
C750 0.1
IC703
AN8389SE1
FOCUS COIL / TRACKING COIL / TRAVERSE MOTOR / SPINDLE MOTOR DRIVE
Terminal guide : on page 36
C734 10V220
C735 0.1
PVcc1
PGND1
D1-
D1+
D2-
D2+
D3-
D3+
D4-
D4+
PGND2
PVcc2
PC1
IN1
PC2
IN2
GND
NRESET
NC
GND
IN3
IN4
VREF
Vcc
7.7V
R736 100
TP36
M702 SPINDLE MOTOR
C737 0.1
TP35
TP38
M701 TRAVERSE MOTOR
C736 0.1
TP37
R722 56K
R723 1.8K
R735 100
R724 33K
R725 4.7K
R748 1.8K
C738 0.15
R727 8.2K
R726 47K
R749 6.8K
C752 1500P
TP28
R728 10K
R731 8.2K
C714 6.3V100


IC702
MN662740RM1
SERVO PROCESSOR /DIGITAL SIGNAL PROCESSOR /DIGITAL FILTER/D/A CONVERTER
Terminal guide : on pages 34,35
BCLK ①
LRCK ②
SRDATA ③
DVDD1 ④
DVss1 ⑤
TX ⑥
MCLK ⑦
MDATA ⑧
MLD ⑨
SENSE ⑩
/FLOCK ⑪
/TLOCK ⑫
BLKCK ⑬
SQCK ⑭
SUBQ ⑮
DMUTE ⑯
STAT ⑰
/RST ⑱
SMCK ⑲
PMCK ⑳
TRV ㉑
TVD ㉒
PC ㉓
ECM ㉔
ECS ㉕
KICK ㉖
TRD ㉗
FOD ㉘
VREF ㉙
FBAL ㉚
TBAL ㉛
FE ㉜
TE ㉝
RFENV ㉞
VDET ㉟
OFT ㊱
TRCRS ㊲
/RFDET ㊳
BDO ㊴
LDON ㊵
TES (41)
PLAY (42)
WVEL (43)
ARF (44)
IREF (45)
DRF (46)
DSLF (47)
PLLF (48)
VCOF (49)
AVDD2 (50)
AVss2 (51)
EFM (52)
PCK (53)
PDO (54)
SUBC (55)
SBCK (56)
Vss (57)
X1 (58)
X2 (59)
VDD (60)
BYTCK (61)
/CLDCK (62)
FCLK (63)
IPFLAG (64)
FLAG (65)
CLVS (66)
CRC (67)
DEMPH (68)
RESY (69)
/RST2 (70)
/TEST (71)
AVDD1 (72)
OUTL (73)
AVss1 (74)
OUTR (75)
RSEL (76)
CSEL (77)
PSEL (78)
MSEL (79)
SSEL (80)
4.9V
5V
4.9V
2.1V
2.1V
4.9V
5V
5V
2.5V
2.3V
5V
(0V) 0.4V
5V
5V
(2.2V) 0V
2.4V
1.2V
2.4V
(4.9V) 0V
5V
2.4V
4.8V
0V
4.9V
0V
4.9V(0V)
0V
0V
4.9V(4.4V)
0V(4.8V)
0V(4.9V)
4.9V
(4.9V) 0V
0V
(0V) 4.9V
2.4V
0V
0V
2.5V
2.5V
2.5V
2.5V
2.5V
2.5V
2.5V
2.5V
(0V) 4.8V
2.5V
2.5V
C730 0.1
C731 6.3V220
R721 100
5V
TP20
TP18
TP23
R717 1K
C727 50V1
C725 1000P
C726 1000P
R718 1K
R720 0Ω
C728 50V1
TP21
PLAY 3V P-P 1KHz,0dB
PLAY 5V 0V T=140 μs.
5.6V P-P F=16.9344MHz
C754 470P
C724 0.1
C723 10V220
C732 6.3V220
C733 0.1
C722 15P
X701 (16.9344MHz)
R714 120
C721 10P
PLAY 1.9V P-P F=16.9344MHz
PLAY 5V 0V T=13.6ms.
PLAY 5V 0V T=13.6ms.
PLAY 5V 0V T=13.6ms.
PLAY 5V 0V T=13.6ms.
PLAY 5V 0V F=75Hz
PLAY 1.2V P-P 0.5 μs. 0.2V/DIV.
R711 150K
R709 68K
C744 8200P
R745 1.5M
C717 0.1
C718 0.22
R712 220
47K
R750
R751 47K
PLAY 0.4V P-P 2ms. 0.2V/DIV.
PLAY 0.3V P-P 2ms. 0.1V/DIV.
C745 1000P
A B C D E F G H I J K L
TP2 TP3 TP4 TP5 TP6 TP7 TP8 TP9 TP10 TP11 TP12 TP13 TP14 TP17
5V 0V 0.1 μs. 2V/DIV.
C753 470P
S701 (REST)
TP1
TP15
C743 0.1
TP19
TP22
TP16
7.7V
CN702
① REST SW
② SUBC
③ / RST
④ STAT
⑤ SBCK
⑥ SUBQ
⑦ SQCK
⑧ BLKCK
⑨ / TLOCK
⑩ / FLOCK
⑪ SENSE
⑫ MLD
⑬ M DATA
⑭ MCLK
⑮ P.GND
⑯ +B(1)
⑰ TX
⑱ CLDCK
⑲ D.GND
⑳ +B(2)
㉑ Rch OUT
㉒ A.GND
㉓ Lch OUT
To G MAIN CIRCUIT(CN402) on page 28

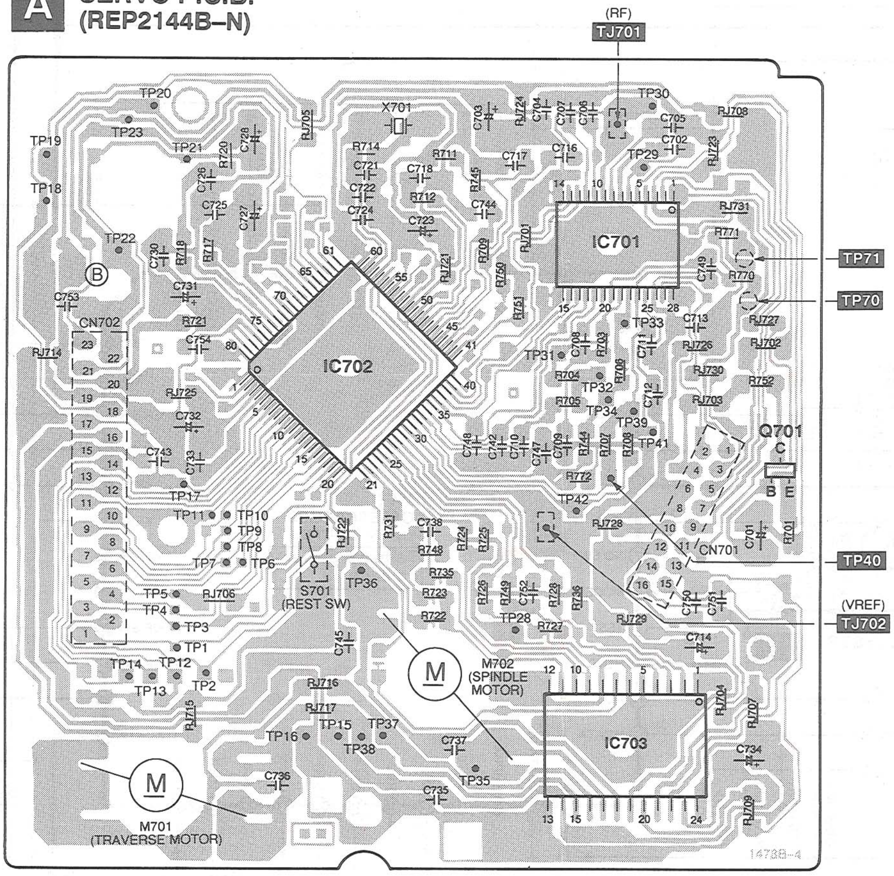

B SWITCH CIRCUIT
(P.C.Board : on page 30)
S5
(DISC NUMBER DET)
W1
C SWITCH(S2,S3) CIRCUIT
(P.C.Board : on page 30)
S3
(UP POSITION DET)
S2
(PLAY POSITION DET)
W2
D LED CIRCUIT
(P.C.Board : on page 31)
D610
D609
R625 220
D607-610
LNJ401NPYJA
BACK LIGHT
D608
D607
R626 220
W601B
E LOADING MOTOR CIRCUIT
(P.C.Board : on page 30)
IC1
BA6418N
MOTOR DRIVE
CONTROL LOGIC
TSD
DRIVER
0V
0V
7.7V
6.2V
6.2V
C1
10V82
LOADING MOTOR
M
S1(STOCKER POSITION DET)
S4(TRAY OPEN DET)
CN1
G MAIN CIRCUIT
(P.C.Board : on page 31)
CN401
7.7V
7.7V
F OPERATION CIRCUIT
(P.C.Board : on page 31)
W601A
W401B
W401A
7.7V
5V
C602 50V1
R601 100K
C601 0.01
D617 MA165TA
R610 270
R609 270
D606
(DISC5) D605
R604 100
R603 100
R602 100
C603 100P
C604 100P
C605 100P
5V
(0V) 4.8V
4.8V 0V
4.8V
0V
4.9V
5V
0V
0V
VDD
STOP
PLAY
DISK5
5PLAY
/CLR
/STB
CLK
DATA
IC601
NJU3713GTE1
LED DRIVE
1PLAY
DISC1
2PLAY
DISC2
Vss
3PLAY
DISC3
4PLAY
DISC4
0V
4.8V (4.8V)
(0V)
0V
4.8V
0V
4.8V
0V
4.8V
(DISC1) D601
(DISC2) D602
(DISC3) D603
(DISC4) D604
R605 270
R606 270
R607 270
R608 270
D601-606
SPR505MDTT
R611 22K
R612 12K
R613 6.8K
R614 4.7K
S601 (DISC5)
S602 (DISC4)
S603 (DISC3)
S604 (DISC2)
S605 (DISC1)
R619 2.2K
R620 1.8K
R621 1.5K
R622 1.2K
R623 1K
R624 820
S610 (⏮/⏭)
S611 (■)
S612 (▶)
S613 (⏭/⏮)
S614 (❚❚)
S615(⏏OPEN/CLOSE)
R618 3.3K
R617 4.7K
R616 6.8K
R615 12K
S609 (RANDOM)
S608 (AI EDIT)
S607 (REPEAT)
S606 (DISC CHECK)
C416 1000P
C417 1000P
REF -M
CN402
REST SW
SUBC
/RST
STAT
SBCK
SUBQ
SQCK
BLKCK
/TLOCK
/FLOCK
SENSE
MLD
MDATA
MCLK
P.GND
+B(1)
TX
CLDCK
D.GND
+B(2)
Rch IN
A.GND
Lch IN
R426 1K
To A SERVO CIRCUIT (CN702) on page 27
7.7V
C404 0.01
5V
R429 10K
L402
DIGITAL (OPTICAL OUT)
IN
Vcc
GND
2.2V
5V
C409 0.01
IC402
TOTX178
TRANSMISSON MODULE
R815 100
C807 6.3V47
C405 0.01
C406 6.3V220
IC801
BA4558FHTT1
L.P.FILTER
C403 1000P
C803 330P
R811 3.3K
C809 10V22
R447 220
R801 1K
R805 22K
R807 22K
C413 100P
C801 1000P
R803 100K
C805 120P
R809 27K
0V
0V
0V
4.9V
R449 47K
C811 100P
C414 100P
C802 1000P
R804 100K
C806 120P
R810 27K
-5V
0V
0V
0V
R450 47K
C812 100P
R802 1K
R806 22K
R808 22K
R812 3.3K
C810 10V22
R448 220
C804 330P
C808 6.3V47
R816 100
5V


IC401
LC66538A4G99
SYSTEM CONTROL
Terminal guide : on page 33
NC
Vss
OSC1
OSC2
VDD
/RST
NO SW
MODE
TEST
HOLD
MLD
MDATA
GMUTE
ESPD
BLKCK
SQCK
DMUTE
SUBQ
STAT
SVRST
REST SW
TLOCK
FLOCK
SENSE
FWD
REV
OPEN SW
PLY SW
KEY2
KEY1
VDATA
VCLK
UP SW
STOCK SW
LDATA
MCLK
VDATA IN
EMPHA
MUTE
CS
REQ
DTI
DTO
CLK
VCS
LSTB
LCLK
X401 (4.23MHz)
F=4.23MHz
4.2V P-P
5.2V P-P
R401 1M
R402 1K
L401 10 μ H
C401 50V3.3
D401 MA165TA
Q401
DTC114YSTP
RESET
TEST MODE
R403 100K
C402 1000P
R412 10K
C410 6.3V47
C411 0.1
R413 10K
R457 47K
R404 470
R405 100
R406 470
R454 1K
R446 4.7K
R411 10K
R415 10K
R416 10K
R417 10K
R419 10K
R420 10K
R421 10K
R422 10K
R455 470
R456 470
R452 10K
R453 47K
R418 10K
R407 12K
Q405
2SA1309AQSTA
SWITCHING
KEY2
R408 10K
R409 10K
R410 10K
R414 470
R423 100
R424 100
R425 100
PLAY
T=13.6ms.
T=20ms.
7.7V
5V
IC1
LM2940T5M
REGULATOR
Q1
2SB1548PQAU
REGULATOR
C4 1000P
R3 22K
D3,4 MA165TA
Q2
2SC3311AIQST
REGULATOR
R4 100
R5 1K
R2 470
D5 MA4075MTA
C5 16V47
C1 16V2200
C2 0.01
C3 0.01
D1,2 RL1N4003N02
AC IN
POWER SUPPLY POINT
GND
C407 10V220
E1
R440 47K
R439 12K
R432 12K
R433 10K
C415 6.3V47
Q403
Q404
R443 4.7K
R442 3.3K
R441 4.7K
R444 4.7K
R435 100
R434 1K
R445 1K
Q402
R436 4.7K
R437 4.7K
R438 1K
C408 100P
Q402-404
2SC3311AIQST
INTERFACE
R6 270
R7 270
D6 RL1N4003N02
D7 MA4051MTA
C8 25V100
-5V
L1
L2
JK401
AC
REQ
CT
CS
AC
D.GND
CLK
DATA
G.DECK
A.GND
KEY2
KEY-IN
REF-M
Rch OUT
A.GND
A.GND
Lch OUT
To ST-CA10 : JK602 on page 23

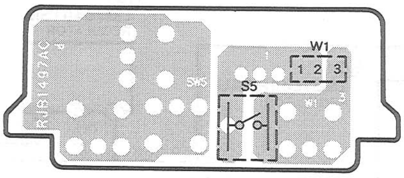
PRINTED CIRCUIT BOARD DIAGRAM

- This printed circuit board diagram may be modified at any time with the development of new technology.

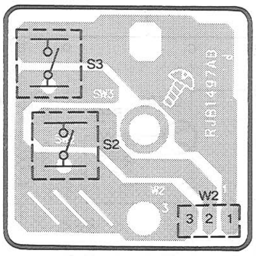
A SERVO P.C.B. (REP2144B–N)


(RF)
TJ701
TP71
TP70
TP40
(VREF)
TJ702
IC701
IC702
IC703
X701
CN702
CN701
Q701
C
B E
S701 (REST SW)
M702 (SPINDLE MOTOR)
M701 (TRAVERSE MOTOR)
M
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TP8
TP9
TP10
TP11
TP12
TP13
TP14
TP15
TP16
TP17
TP18
TP19
TP20
TP21
TP22
TP23
TP28
TP29
TP30
TP31
TP32
TP33
TP34
TP35
TP36
TP37
TP38
TP39
TP41
TP42
1473B-4

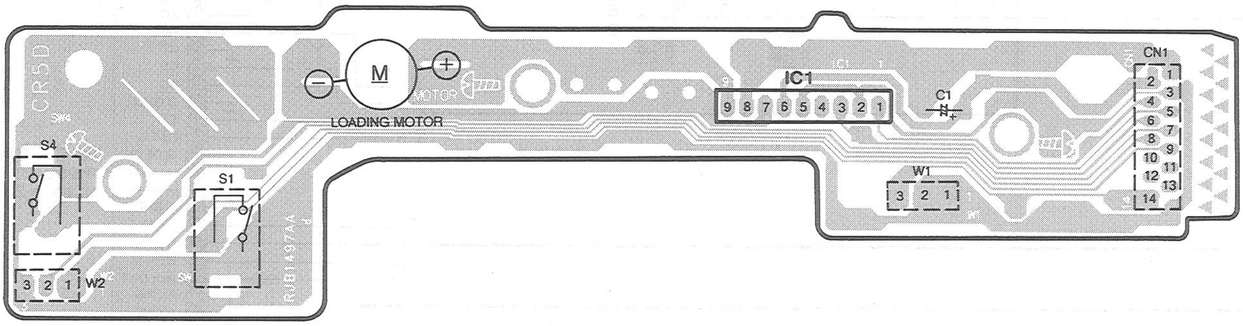
B SWITCH P.C.B. (REP2182A–N)


W1
1 2 3
S5
SW5
RJB1497AC

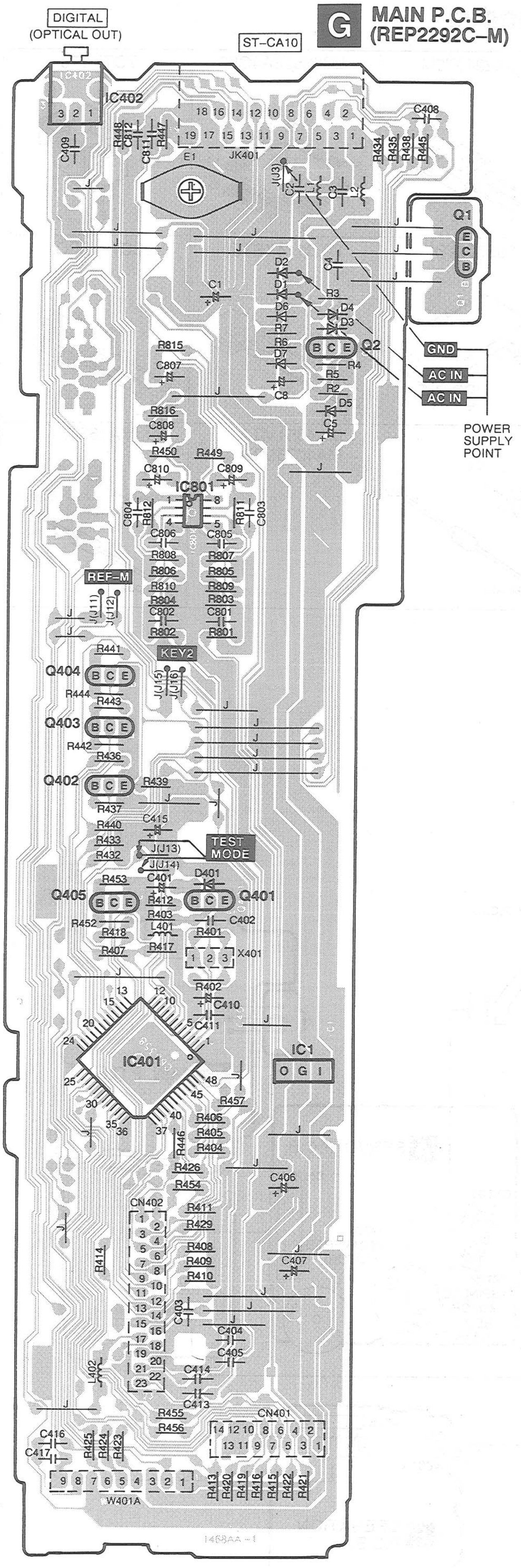
C SWITCH(S2,S3) P.C.B. (REP2182A–N)


S3
S2
W2
3 2 1
RJB1497AB

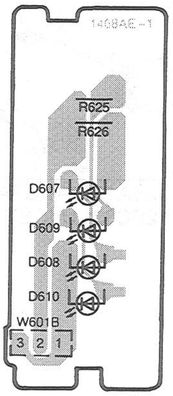
E LOADING MOTOR P.C.B. (REP2182A–N)


M
LOADING MOTOR
IC1
9 8 7 6 5 4 3 2 1
C1
CN1
1 2 3 4 5 6 7 8 9 10 11 12 13 14
W1
3 2 1
S4
S1
W2
3 2 1
CR5D
RJB1497AA

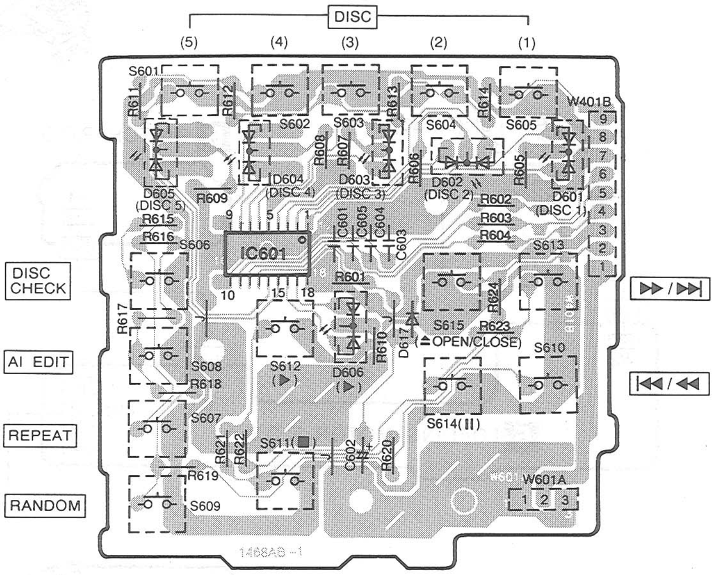
G MAIN P.C.B. (REP2292C–M)


DIGITAL
(OPTICAL OUT)
ST–CA10
IC402
JK401
E1
Q1
Q2
GND
AC IN
AC IN
POWER SUPPLY POINT
IC801
REF–M
KEY2
Q404
Q403
Q402
TEST MODE
Q405
Q401
X401
IC401
IC1
CN402
CN401
W401A
1468AA–1

D LED P.C.B. (REP2292C–M)

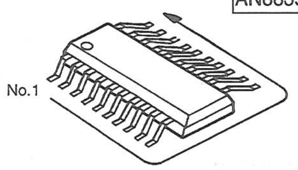

1468AE–1
R625
R626
D607
D609
D608
D610
W601B

F OPERATION P.C.B. (REP2292C–M)

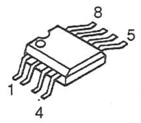

DISC
(5)
(4)
(3)
(2)
(1)
S601
S602
S603
S604
S605
W401B
D605 (DISC 5)
D604 (DISC 4)
D603 (DISC 3)
D602 (DISC 2)
D601 (DISC 1)
IC601
DISC CHECK
AI EDIT
REPEAT
RANDOM
S606
S608
S607
S609
S612 (▶)
D606 (▶)
S611 (■)
S615 (⏏ OPEN/CLOSE)
S614 (II)
S613
S610
▶▶/▶▶|
|◀◀/◀◀
W601A
1468AB–1

• Terminal guide of IC's , transistors and diodes

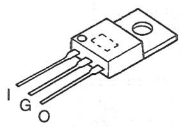
NJU3713GTE1	18PIN
AN8835SBE1	28PIN



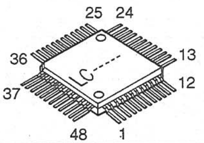
BA4558FHTT1



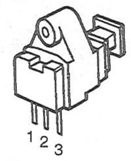
LM2940T5M



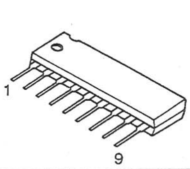
LC66538A4G99


25 24
36
13
37
12
48
1

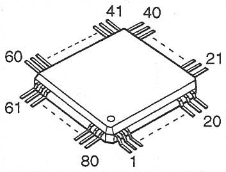
TOTX178



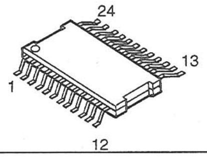
BA6418N



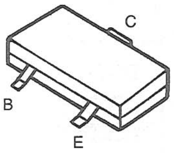
MN662740RM1


41 40
60
21
61
20
80 1

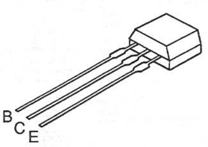
AN8389SE1



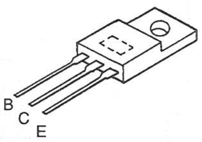
2SB709STX



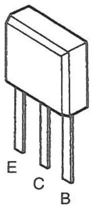
DTC114YSTP



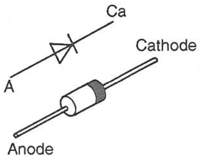
2SB1548PQAU



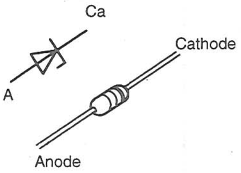
2SA1309AQSTA
2SC3311AIQST



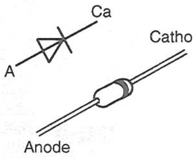
RL1N4003N02


Ca
Cathode
A
Anode

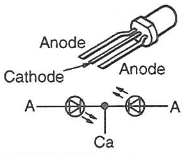
MA4051MTA
MA4075MTA


Ca
Cathode
A
Anode

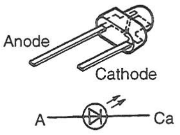
MA165TA


Ca
Cathode
A
Anode

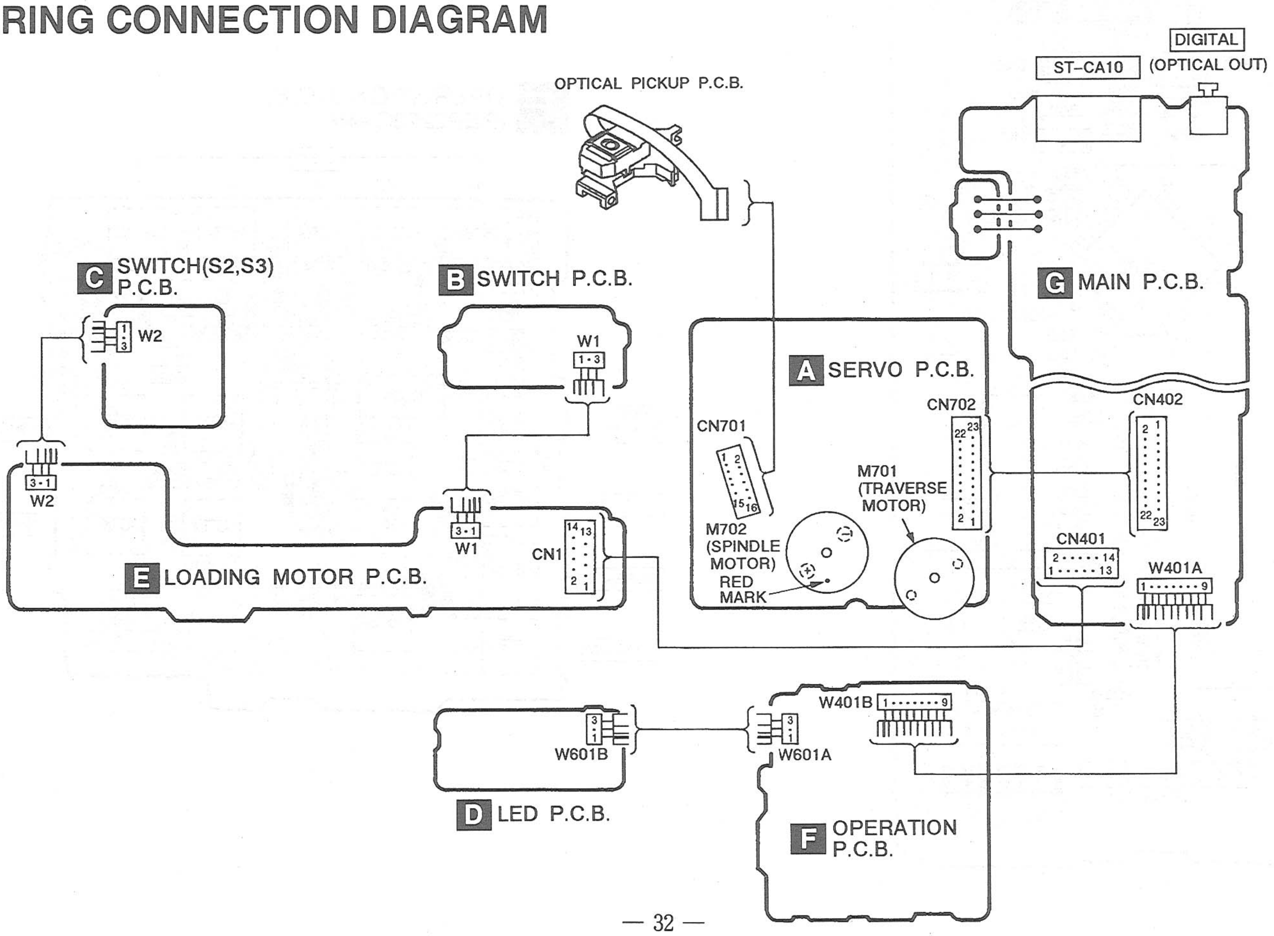
SPR505MDTT


Anode
Cathode
Anode
A
A
Ca

LNJ401NPYJA


Anode
Cathode
A
Ca

WIRING CONNECTION DIAGRAM


DIGITAL
ST-CA10
(OPTICAL OUT)
OPTICAL PICKUP P.C.B.
C SWITCH(S2,S3) P.C.B.
W2
3
1
B SWITCH P.C.B.
W1
1·3
G MAIN P.C.B.
A SERVO P.C.B.
CN702
CN402
CN701
M701 (TRAVERSE MOTOR)
M702 (SPINDLE MOTOR)
RED MARK
3·1
W2
3·1
W1
14 13
CN1
2 1
E LOADING MOTOR P.C.B.
CN401
2······14
1······13
W401A
1·······9
22 23
2 1
1 2
15 16
W401B
1·······9
W601B
W601A
D LED P.C.B.
F OPERATION P.C.B.

TERMINAL GUIDE

● IC401 (LC66538A4G99): System Control

Pin No.	Mark	I/O Division	Function
1	NC	–	Not used, connected to GND
2	VSS	–	GND terminal
3	OSC1	I	Crystal OSC terminal (f=4.23 MHz)
4	OSC2	O	
5	VDD	I	Power supply terminal
6	/RST	I	Reset signal input terminal ("L"=RESET)
7	NO SW	I	Disc tray No. det. input terminal
8	MODE	I	Test mode signal input terminal
9	TEST	–	Test terminal
10	HOLD	I	Not used, connected to power supply
11	MLD	O	Command load signal
12	MDATA	O	Command data signal
13	MCLK	O	Command clock signal
14	VDATA IN	–	Not used, connected to GND
15	EMPHA	–	Not used, open
16	MUTE	–	Not used, open
17	CS	O	Communication request signal to ST-CA10
18	REQ	I	Communication request signal from ST-CA10
19	DTI	I	Communication data signal from ST-CA10
20	DTO	O	Communication data signal to ST-CA10
21	CLK	O	Communication clock signal to ST-CA10
22	VCS	–	Not used, open
23	LSTB	O	LED drive output terminal
24	LCLK	O	LED drive command clock output terminal
25	LDATA	O	LED drive command clock output terminal
26	–	–	Not used, connected to power supply
27	STOCK SW	I	Stocker position det. input terminal
28	UP SW	I	Disc tray up position det. input terminal
29	VCLK	–	Not used, open
30	VDATA	–	Not used, open
31	KEY1	I	Key switch det. input terminal
32	KEY2		
33	PLY SW	I	Disc tray play position det. input terminal
34	OPEN SW	I	Disc tray open position det. input terminal
35	REV	O	Loading motor reverse signal output terminal
36	FWD	O	Loading motor forward signal output terminal
37	SENSE	I	Sense signal input terminal
38	FLOCK	I	Optical servo condition (focus) ("L": lead-in)
39	TLOCK	I	Optical servo condition (tracking) ("L": lead-in)
40	REST SW	I	Rest position det. input terminal
41	SVRST	O	Reset signal to servo processor
42	STAT	I	Status signal input terminal
43	SUBQ	I	Sub-code Q data input terminal
44	DMUTE	–	Not used, open
45	SQCK	O	Sub-code Q resister clock output terminal
46	BLKCK	I	Sub-code block clock input terminal (f=75Hz)
47	ESPD	–	Not used, connected to power supply
48	GMUTE	–	Not used, open

● IC702 (MN662740RM1): Servo processor/ digital signal processor/ digital filter/ D/A converter

Pin No.	Mark	I/O Division	Function
1	BCLK	O	Serial bit clock terminal (Not used, open)
2	LRCK	O	L/R discriminating signal (Not used, open)
3	SRDATA	O	Serial data (Not used, open)
4	DVDD1	I	Power supply (digital circuit) terminal
5	DVss 1	—	GND (digital circuit) terminal
6	TX	O	Digital audio interface signal
7	MCLK	I	Command clock signal
8	MDATA	I	Command data signal
9	MLD	I	Command load signal ("L":LOAD)
10	SENSE	O	Sense signal (OFT, FESL, NACEND, NAJEND, POSAD, SFG)
11	/FLOCK	O	Optical servo condition (focus) ("L": lead-in)
12	/TLOCK	O	Optical servo condition (tracking) ("L": lead-in)
13	BLKCK	O	Sub-code block clock (f=75Hz) (Not used, open)
14	SQCK	I	Sub-code Q register clock
15	SUBQ	O	Sub-code Q data
16	DMUTE	I	Muting input ("H": MUTE) (Not used, connected to GND)
17	STAT	O	Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQCK)
18	/RST	I	Reset signal ("L": reset)
19	SMCK	O	System clock (f=4.2336MHz) (Not used, open)
20	PMCK	O	Frequency division clock signal (No used, open) (f=$\frac{1}{1.92}$x ck=88.2kHz)
21	TRV	O	Traverse servo control
22	TVD	O	Traverse drive signal
23	PC	O	Turntable motor drive signal ("L": ON)
24	ECM	O	Turntable motor drive signal (Forced mode)
25	ECS	O	Turntable motor drive signal (Servo error signal)
26	KICK	O	Kick pulse output
27	TRD	O	Tracking drive signal output
28	FOD	O	Focus drive signal output
29	VREF	I	D/A drived output (TVD, ECS, TRD, FOD, FBAL, TBAL) normal voltage input terminal
30	FBAL	O	Focus balance adj. output
31	TBAL	O	Tracking balancef adj. output
32	FE	I	Focus error signal (analog input)
33	TE	I	Tracking error signal (analog input)
34	RFENV	I	RF envelope signal
35	VDET	I	Oscillation det. signal ("H": det.)
36	OFT	I	Off track signal ("H": Off track)
37	TRCRS	I	Track cross signal input
38	/RFDET	I	RF detection signal ("L": detection)
39	BDO	I	Dropout detection signal ("H": dropout)
40	LDON	O	Laser power control ("H": ON)
41	TES	O	Tracking error shunt output ("H": dropout)
42	PLAY	O	Play signal ("H": play) (Not used, open)

Pin No.	Mark	I/O Division	Function
43	WVEL	O	Double velocity status signal ("H": double) (Not used, open)
44	ARF	I	RF signal input
45	IREF	I	Reference current input
46	DRF	I	DSL bias terminal (Not used, open)
47	DSLF	I/O	DSL loop filter terminal
48	PLLF	I/O	PLL loop filter terminal
49	VCOF	I/O	VCO loop filter terminal
50	AVDD2	I	Power supply (analog circuit) terminal(2)
51	AVss2	—	GND (analog circuit) terminal
52	EFM	O	EFM signal (Not used, open)
53	PCK	O	PLL extract clock (f= 4.3218MHz) (Not used, open)
54	PDO	O	Phase comparated signal of EFM and PCK (Not used, open)
55	SUBC	O	Sub-code serial output clock (Not used, open)
56	SBCK	I	Sub-code serial data (Not used, connected to power supply)
57	V ss	—	GND terminal
58	X1	I	Crystal oscillator terminal (f=16.9344MHz)
59	X2	O	
60	VDD	I	Reset signal ("L": reset)
61	BYTCK	O	Byte clock signal (Not used, open)
62	/CLDCK	O	Sub-code frame clock signal (f CLDCK=7.35KHz: Normal) (Not used, open)
63	FCLK	O	Crystal frame clock (Not used, open)
64	IPFLAG	O	Interpolation flag terminal (Not used, open)

Pin No.	Mark	I/O Division	Function
65	FLAG	O	Flag terminal (Not used, open)
66	CLVS	O	Turntable servo phase synchro signal ("H": CLV, "L": Rough servo) (Not used, open)
67	CRC	O	Sub-code CRC check terminal ("H": ON, "L": NG) (Not used, open)
68	DEMPH	O	De-emphasis ON signal ("H": ON) (Not used, open)
69	RESY	O	Re-synchronizing signal of frame sync. (Not used, open)
70	/RST2	I	Reset terminal after " MASH" circuit (Not used, connected to power supply)
71	/TEST	I	Test terminal (Normal: "H") (Not used, connected to power supply)
72	AVDD1	I	Power supply (analog circuit) terminal (1)
73	OUTL	O	Lch audio signal
74	AV ss1	—	GND (analog circuit) terminal (1)
75	OUTR	O	Rch audio signal
76	RSEL	I	Polarity direction control terminal of RF signal (Not used, connected to power supply
77	CSEL	I	Frequency control terminal of crystal oscillator (Not used, connected to GND)
78	PSEL	I	Test terminal (Normal:"L") (Not used, connected to GND)
79	MSEL	I	"SMCK" terminal frequency select ("L": SMCK=4.2336MHz) (Not used, connected to GND)
80	SSEL	O	"SUBQ" terminal mode select ("H": Q code buffer) (Not used, connected to power supply

● IC701 (AN8835SBE1): Servo amp

Pin No.	Mark	I/O Division	Function
1	PDA	I	Focus signal input terminal 1 (Ach)
2	PDB	I	Focus signal input terminal 2 (Bch)
3	VCC	I	Power supply terminal
4	LPD	I	Laser PD signal
5	LD	O	Laser power auto control output
6	RF	O	RF amp terminal
7	RF IN	I	AGC input terminal
8	CAGC	I	AGC detection capacitor input
9	ARF	O	RF signal
10	CSBRT	I	OFTR capacitor connection terminal
11	CEA	I	HPF-AMP capacitor connection terminal
12	BDO	O	Dropout detection control
13	LDON	I	LD APC ON/OFF ("H": ON, "L": OFF)
14	GND	—	GND terminal
15	/RFDET	O	RF det. signal ("L": det.)
16	CROSS	O	Tracking error zero cross output
17	OFTR	O	Off track detection ("H": det.)
18	VDET	O	Oscillation det. signal ("H": det.)
19	ENV	O	Envelope output terminal
20	TEBPF	I	Oscillation detect input terminal (Not used, open)
21	CCRS	I	CROSS capacitor connection terminal
22	TE	O	Tracking error signal
23	FE	O	Focusing error signal
24	TBAL	I	Tracking balance adj. input
25	FBAL	I	Focus balance adj. input
26	VREF	O	Reference voltage output
27	PDE	I	Tracking signal input terminal 1 (Ech)
28	PDF	I	Tracking signal input terminal 2 (F ch)

● IC703(AN8389SE1): Focus coil/ tracking coil/ traverse coil/ spindle motor

Pin No.	Mark	I/O Division	Function
1	Vcc	I	Power supply terminal
2	VREF	I	Reference voltage input
3	IN4	I	Motor driver (4) input
4	IN3	I	Motor driver (3) input
5	GND	—	GND terminal
6	NC	—	Not used, connected to GND
7	NRESET	O	Reset terminal (Not used, open)
8	GND	—	GND terminal
9	IN2	I	Motor driver (2) input
10	PC2	I	PC2 (power cut)input
11	IN1	I	Motor driver (1) input
12	PC1	I	PC1 (power cut) input (Not used, connected to GND)
13	PVcc1	I	Driver power supply (1)
14	PGND1	—	Driver GND terminal (1)
15	D1-	O	Motor driver (1) output terminal (-)
16	D1+	O	Motor driver (1) output terminal (+)
17	D2-	O	Motor driver (2) output terminal (-)
18	D2+	O	Motor driver (2) output terminal (+)
19	D3-	O	Motor driver (3) output terminal (-)
20	D3+	O	Motor driver (3) output terminal (+)
21	D4-	O	Motor driver (4) output terminal (-)
22	D4+	O	Motor driver (4) output terminal (+)
23	PGND2	—	Driver GND terminal (2)
24	PVcc2	I	Driver power supply (2)

RESISTORS AND CAPACITORS

Notes: * Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
* Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM)

Ref. No.	Part No.	Values & Remarks
		RESISTORS
R2	ERDS2TJ471	1/4W 470
R3	ERDS2TJ223	1/4W 22K
R4	ERDS2TJ101	1/4W 100
R5	ERDS2TJ102	1/4W 1K
R6, 7	ERDS2TJ271	1/4W 270
R401	ERDS2TJ105T	1/4W 1M
R402	ERDS2TJ102	1/4W 1K
R403	ERDS2TJ104	1/4W 100K
R404	ERDS2TJ471	1/4W 470
R405	ERDS2TJ101	1/4W 100
R406	ERDS2TJ471	1/4W 470
R407	ERDS2TJ123	1/4W 12K
R408-413	ERDS2TJ103	1/4W 10K
R414	ERDS2TJ471	1/4W 470
R415-422	ERDS2TJ103	1/4W 10K
R423-425	ERDS2TJ101	1/4W 100
R426	ERDS2TJ102	1/4W 1K
R429	ERDS2TJ103	1/4W 10K
R432	ERDS2TJ123	1/4W 12K
R433	ERDS2TJ103	1/4W 10K
R434	ERDS2TJ102	1/4W 1K
R435	ERDS2TJ101	1/4W 100
R436, 437	ERDS2TJ472	1/4W 4.7K
R438	ERDS2TJ102	1/4W 1K
R439	ERDS2TJ123	1/4W 12K
R440	ERDS2TJ473	1/4W 47K
R441	ERDS2TJ472	1/4W 4.7K
R442	ERDS2TJ332	1/4W 3.3K
R443, 444	ERDS2TJ472	1/4W 4.7K
R445	ERDS2TJ102	1/4W 1K
R446	ERDS2TJ472	1/4W 4.7K
R447, 448	ERDS2TJ221	1/4W 220
R449, 450	ERDS2TJ473	1/4W 47K
R452	ERDS2TJ103	1/4W 10K
R453	ERDS2TJ473	1/4W 47K
R454	ERDS2TJ102	1/4W 1K
R455, 456	ERDS2TJ471	1/4W 470
R457	ERDS2TJ473	1/4W 47K
R601	ERDS2TJ104	1/4W 100K
R602-604	ERDS2TJ101	1/4W 100
R605-610	ERDS2TJ271	1/4W 270
R611	ERDS2TJ223	1/4W 22K
R612	ERDS2TJ123	1/4W 12K
R613	ERDS2TJ682T	1/4W 6.8K
R614	ERDS2TJ472	1/4W 4.7K
R615	ERDS2TJ123	1/4W 12K

Ref. No.	Part No.	Values & Remarks
R616	ERDS2TJ682T	1/4W 6.8K
R617	ERDS2TJ472	1/4W 4.7K
R618	ERDS2TJ332	1/4W 3.3K
R619	ERDS2TJ222	1/4W 2.2K
R620	ERDS2TJ182	1/4W 1.8K
R621	ERDS2TJ152	1/4W 1.5K
R622	ERDS2TJ122	1/4W 1.2K
R623	ERDS2TJ102	1/4W 1K
R624	ERDS2TJ821	1/4W 820
R625, 626	ERDS2TJ221	1/4W 220
R801, 802	ERDS2TJ102	1/4W 1K
R803, 804	ERDS2TJ104	1/4W 100K
R805-808	ERDS2TJ223	1/4W 22K
R809, 810	ERDS2TJ273	1/4W 27K
R811, 812	ERDS2TJ332	1/4W 3.3K
R815, 816	ERDS2TJ101	1/4W 100
		CAPACITORS
C1 ⚠	ECA1CM222B	16V 2200U
C2, 3	ECBT1E103ZF	25V 0.01U
C4	ECBT1H102KB5	50V 1000P
C5	RCE1CKA470BG	16V 47U
C8	ECA1EM101B	25V 100U
C401	RCE1HKA3R3BG	50V 3.3U
C402, 403	ECBT1H102KB5	50V 1000P
C404, 405	ECBT1E103ZF	25V 0.01U
C406	RCE0JKA221BV	6.3V 220U
C407	ECEA1AKA221B	10V 220U
C408	ECBT1H101KB5	50V 100P
C409	ECBT1E103ZF	25V 0.01U
C410	RCE0JKA470BG	6.3V 47U
C411	ECBT1H104ZF5	50V 0.1U
C413, 414	ECBT1H101KB5	50V 100P
C415	RCE0JKA470BG	6.3V 47U
C416, 417	ECBT1H102KB5	50V 1000P
C601	ECBT1E103ZF	25V 0.01U
C602	ECEA1HKA010B	50V 1U
C603-605	ECBT1H101KB5	50V 100P
C801, 802	ECBT1H102KB5	50V 1000P
C803, 804	ECBT1H331KB5	50V 330P
C805, 806	ECBT1H121KB5	50V 120P
C807, 808	RCE0JKA470BG	6.3V 47U
C809, 810	ECEA1AKA220B	10V 22U
C811, 812	ECBT1H102KB5	50V 1000P
		< LOADING P.C.B. >
		CAPACITORS

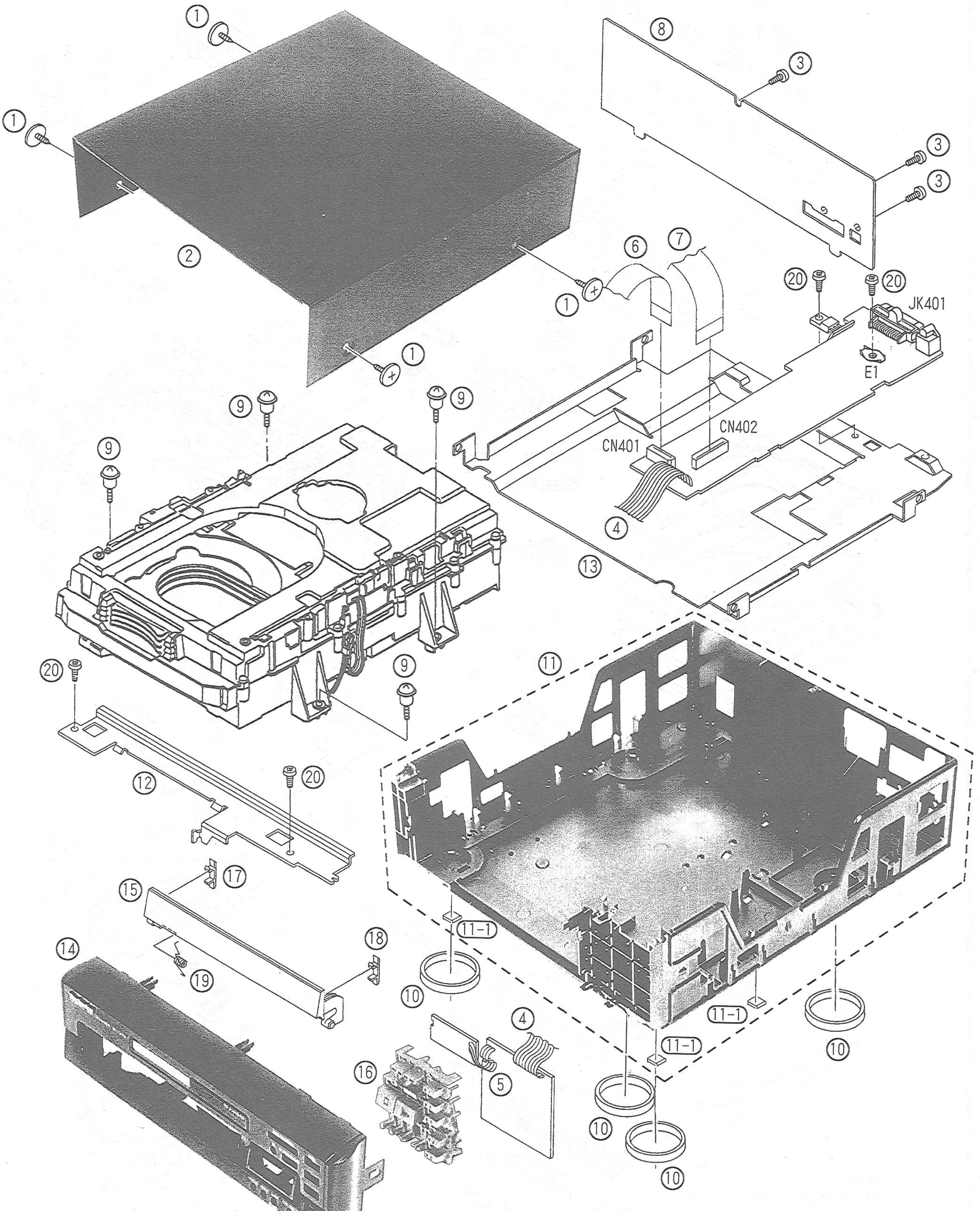
Ref. No.	Part No.	Values & Remarks
C1	ECA1AKF820E	10V 82U
		< SERVO P.C.B >
		RESISTORS
R701	ERJ6GEYJ4R7V	1/10W 4.7
R703	ERJ6GEYJ823	1/10W 82K
R704	ERJ6GEYJ102A	1/10W 1K
R705	ERJ6GEYJ103V	1/10W 10K
R706	ERJ6GEYJ102A	1/10W 1K
R707	ERJ6GEYJ474V	1/10W 470K
R708	ERJ6GEYJ154V	1/10W 150K
R709	ERJ6GEYJ683V	1/10W 68K
R711	ERJ6GEYJ154V	1/10W 150K
R712	ERJ6GEYJ221V	1/10W 220
R714	ERJ6GEYJ121V	1/10W 120
R717, 718	ERJ6GEYJ102A	1/10W 1K
R720	ERJ6GEY0R00A	1/10W 0.00
R721	ERJ6GEYJ101V	1/10W 100
R722	ERJ6GEYJ563V	1/10W 56K
R723	ERJ6GEYJ182V	1/10W 1.8K
R724	ERJ6GEYJ333V	1/10W 33K
R725	ERJ6GEYJ472V	1/10W 4.7K
R726	ERJ6GEYJ473V	1/10W 47K
R727	ERJ6GEYJ822V	1/10W 8.2K
R728	ERJ6GEYJ103V	1/10W 10K
R731	ERJ6GEYJ822V	1/10W 8.2K
R735, 736	ERJ6GEYJ101V	1/10W 100
R744	ERJ6GEYJ103V	1/10W 10K
R745	ERJ6GEYJ155V	1/10W 1.5M
R748	ERJ6GEYJ182V	1/10W 1.8K
R749	ERJ6GEYJ682V	1/10W 6.8K
R750, 751	ERJ6GEYJ473V	1/10W 47K
R752	ERJ8GEYJ220V	1/8W 22
R770, 771	ERJ6GEYJ155V	1/10W 1.5M
R772	ERJ6GEYJ273V	1/10W 27K
		CHIP JUMPERS
RJ701-709	ERJ8GEY0R00A	CHIP JUMPER
RJ714-717	ERJ8GEY0R00A	CHIP JUMPER
RJ721-731	ERJ6GEY0R00A	CHIP JUMPER
		CAPACITORS
C701	ECEA0JKA330I	6.3V 33U
C702	ECUZNE104MBN	25V 0.1U
C703	ECEA0JKA101I	6.3V 100U
C704, 705	ECUZNE104MBN	25V 0.1U

Ref. No.	Part No.	Values & Remarks
C706	ECUV1H272KBN	50V 2700P
C707	ECUV1E273KBN	25V 0.027U
C708	ECUE1H472KBN	50V 4700P
C709	ECUE1C473KBN	16V 0.047U
C710	ECUV1H182KBN	50V 1800P
C711, 712	ECUWNE104ZFN	25V 0.1U
C713	ECUV1C104MBM	16V 0.1U
C714	ECEA0JKA101I	6.3V 100U
C716	ECUE1H561KBN	50V 560P
C717	ECUWNE104ZFN	25V 0.1U
C718	ECUVNC224KBN	16V 0.22U
C721	ECUV1H100DCN	50V 10P
C722	ECUV1H150JCN	50V 15P
C723	ECEA1AKA221I	10V 220U
C724	ECUV1C104MBM	16V 0.1U
C725, 726	ECUE1H102KBN	50V 1000P
C727, 728	ECEA1HPK010I	50V 1U
C730	ECUWNE104ZFN	25V 0.1U
C731, 732	ECEA0JKA221I	6.3V 220U
C733	ECUZNE104MBN	25V 0.1U
C734	ECEA1AKA221I	10V 220U
C735-737	ECUWNE104ZFN	25V 0.1U
C738	ECUV1C154KBN	16V 0.15U
C742	ECUV1E273KBN	25V 0.027U
C743	ECUWNE104ZFN	25V 0.1U
C744	ECUE1E822KBN	25V 8200P
C745	ECUE1H102KBN	50V 1000P
C747	ECUE1H222KBN	50V 2200P
C748	ECUV1H471KBM	50V 470P
C749	ECUZNE104MBN	25V 0.1U
C750	ECUV1C104MBM	16V 0.1U
C751	ECUZNE104MBN	25V 0.1U
C752	ECUE1H152KBN	50V 1500P
C753	ECUV1H471KBM	50V 470P
C754	ECUE1H471KBN	50V 470P

REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS	
1	RHD30007-K1	SCREW	
2	RKM0222-3K	CABINET	
3	XTBS3+8JFZ1	SCREW	
4	RWJ1809125KK	FLAT CABLE(9P)(W401)	
5	RWJ1803055KK	FLAT CABLE(3P)(W601)	
6	REZ0555	FFC(14P)	
7	REZ0765	FFC(23P)	
8	RGR0217B-C	REAR PANEL	
9	RHD30065	SCREW	
10	RKA0068-N	FOOT RING	
11	RFKJLCA7-N	FRAME ASS'Y	
11-1	SHG1654	FOOT RUBBER	
12	RMA0931	REINFORCING PLATE	
13	RSC0425	SHIELD PLATE	
14	RFKGLCA10E-K	FRONT PANEL ASS'Y	
15	RFKNLCA10EBK	TRAY DOOR ASS'Y	
16	RFKNLCA10ECK	BUTTON BLOCK ASS'Y	
17	RKQ0197-X	SLIDE PIECE(L)	
18	RKQ0204-X	SLIDE PIECE(R)	
19	RMB0472	DOOR SPRING	
20	XTB3+8JFZ	SCREW	

CABINET PARTS LOCATION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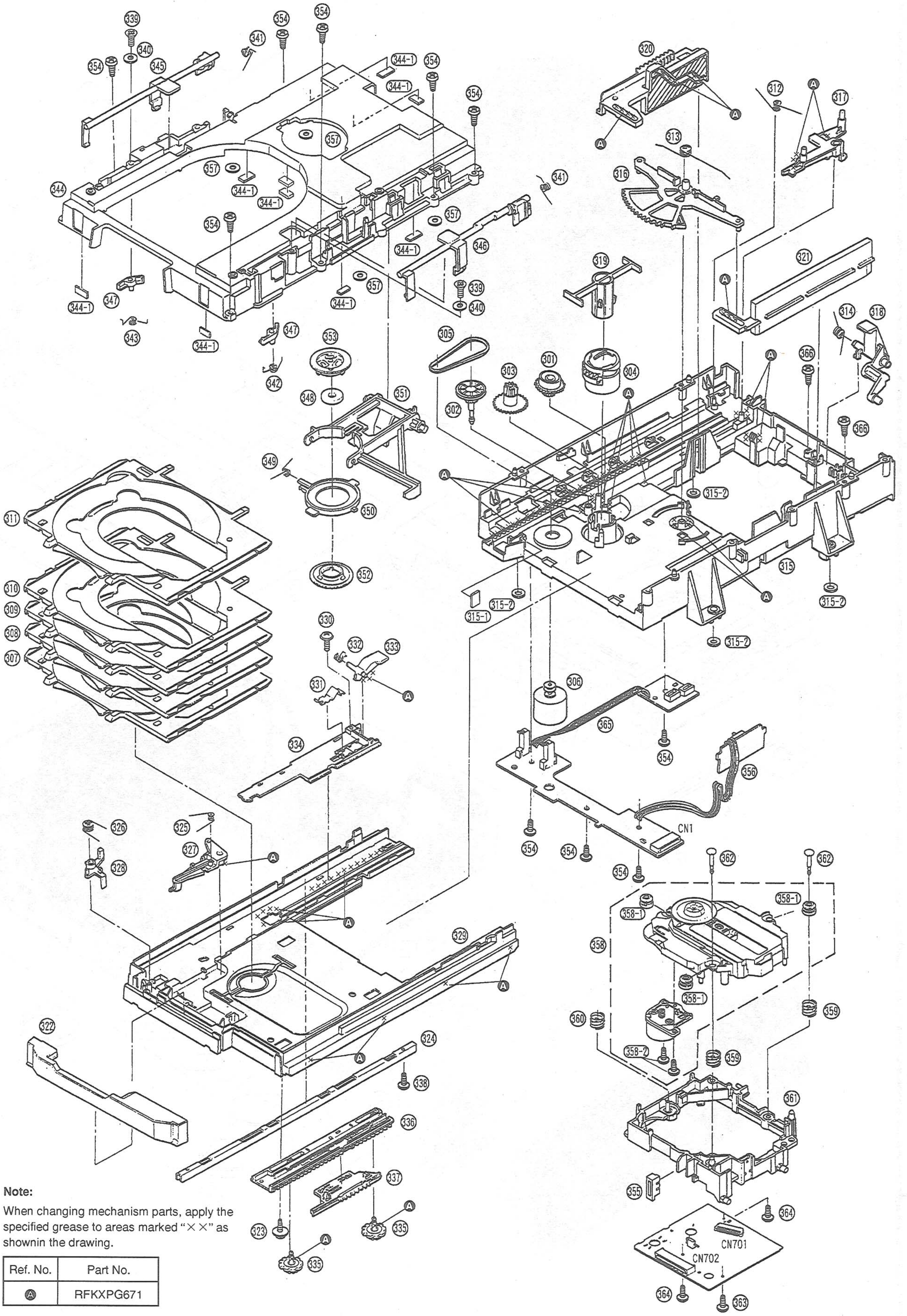
LOADING MECHANISM PARTS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Note:

When changing mechanism parts, apply the specified grease to areas marked "× ×" as shownin the drawing.

Ref. No.	Part No.
Ⓐ	RFKXPG671

REPLACEMENT PARTS LIST

Notes: * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
* Warning: This product uses a laser diode. Refer to caution statements on page 2.
* ACHTUNG: Die lasereinheit nicht zerlegen.
Die lasereinheit darf nur gegen einc vom hersteller spezifizierte einheit ausgetauscht werden.

Ref. No.	Part No.	Part Name & Description	Remarks
		LOADING MECHANISM	
301	RDG0309	INTERMEDIATE GEAR	
302	RDG0310	PULLEY GEAR	
303	RDG0311	DRIVE GEAR	
304	RDG0313	UP/DOWN GEAR	
305	RDV0036	BELT	
306	RFKPDS790PK1	MOTOR ASS'Y	
307	RGQ0170-K	DISC TRAY (1)	
308	RGQ0171-K	DISC TRAY (2)	
309	RGQ0172-K	DISC TRAY (3)	
310	RGQ0173-K	DISC TRAY (4)	
311	RGQ0174-K	DISC TRAY (5)	
312	RME0170	LOCK LEVER SPRING	
313	RME0179	ASSIST SPRING	
314	RME0180	TRAY HOLD SPRING	
315	RFKNACH430GC	MECHANISM BASE ASS'Y	
315-1	RMF0221	FELT	
315-2	RMG0402-K	RUBBER WASHER	
316	RML0379	CONVERSION LEVER	
317	RML0380	LOCK LEVER	
318	RML0383	TRAY HOLD LEVER	
319	RML0385	UP/DOWN LEVER	
320	RMM0139	SLIDE PLATE (1)	
321	RMM0141	SLIDE PLATE (2)	
322	RGQ0175-K	TRAY ORNAMENT	
323	RHD20010	SCREW	
324	RMA0868	REINFORCING ANGLE	
325	RME0171	BASE LOCK LEVER SPRING	
326	RME0172	CARRIER LOCK LEVER SPRING	
327	RML0377	BASE LOCK LEVER	
328	RML0378	CARRIER LOCK LEVER	
329	RMR0884-K	TRAY BASE	
330	RHD20009-1	SCREW	
331	RMC0274	TRAY HOOK SPRING	
332	RME0173	CARRIER ARM SPRING	
333	RML0376-1	CARRIER ARM	
334	RMM0137	CARRIER	
335	RDG0312	SPEED GEAR	
336	RMM0134	DRIVE RACK	
337	RMM0135	CUSHION RACK	
338	XTN2+6F	SCREW	
339	XTS3+8J	SCREW	
340	XWE4E10	WASHER	
341	RME0178	HOLD SPRING	
342	RME0181	LIFT PREVENTION SPRING (1)	
343	RME0182	LIFT PREVENTION SPRING (2)	
344	RFKNLCA10EAK	MECHANISM COVER ASS'Y	
344-1	RMF0221	FELT	
345	RML0381	HOLD NAIL (1)	
346	RML0382	HOLD NAIL (2)	
347	RML0384	LIFT PREVENTION LEVER	
348	RHM245ZA	MAGNET	
349	RME0174	CLAMP LEVER SPRING	
350	RFKNACH430GE	CLAMP BASE ASS'Y	
351	RML0388-1	CLAMP LEVER	
352	RMR0761-W	CLAMPER	
353	RMR0899-K	FIXED PLATE	
354	XTB3+10J	SCREW	
355	RMR0975-W	TRAVERSE CAP	
356	REZ0793	FLAT CABLE (3P) (W1)	
357	RMG0430-Q	RUBBER TUBE	
358	RAE0150Z	TRAVERSE DECK ASS'Y	
358-1	SHGD113-1	FLOATING RUBBER	
358-2	SNSD38	SCREW	
359	RME0109	FLOATING SPRING (1)	
360	RME0142	FLOATING SPRING (2)	
361	RMK0293	TRAVERSE CHASSIS	
362	RMS0123-1	TRAVERSE FIXED PIN	
363	XTN2+6G	SCREW	
364	XTV2+6G	SCREW	
365	REZ0792	FLAT CABLE (3P) (W2)	
366	XTWS3+8T	SCREW	
		INTEGRATED CIRCUIT (S)	
IC1	LM2940T5	REGULATOR	⚠
IC401	LC66538A4G99	SYSTEM CONTROL	
IC402	TOTX178	TRANSMISSON MODULE	
IC601	NJU3713GTE1	LED DRIVE	
IC801	BA4558FHTT1	L. P. F.	
		TRANSISTOR (S)	
Q1	2SB1548PQAU	TRANSISTOR	⚠
Q2	2SC3311AIQST	TRANSISTOR	⚠
Q401	DTC114YSTP	TRANSISTOR	
Q402-404	2SC3311AIQST	TRANSISTOR	
Q405	2SA1309A-R	TRANSISTOR	
		DIODE (S)	
D1, 2	RL1N4003N02	DIODE	⚠

Ref. No.	Part No.	Part Name & Description	Remarks
D3,4	MA165	DIODE	
D5	MA4075MTA	DIODE	⚠
D6	RL1N4003N02	DIODE	
D7	MA4051MTA	DIODE	
D401	MA165	DIODE	
D601-606	SPR505MDTT	L. E. D.	
D607-610	LNJ401NPYJA	L. E. D.	
D617	MA165	DIODE	
		COIL(S)	
L1,2	BL02RN2R65T2	COIL	⚠
L401	RLQA100JT-Y	COIL	
L402	BL02RN2R65T2	COIL	
		OSCILLATOR(S)	
X401	EF0EC4234T3	OSCILLATOR(4.23MHz)	
		SWITCH(ES)	
S601	EVQ21405R	DISC5	
S602	EVQ21405R	DISC4	
S603	EVQ21405R	DISC3	
S604	EVQ21405R	DISC2	
S605	EVQ21405R	DISC1	
S606	EVQ21405R	DISC CHECK	
S607	EVQ21405R	REPEAT	
S608	EVQ21405R	AI EDIT	
S609	EVQ21405R	RANDOM	
S610	EVQ21405R	R. SKIP/SEARCH	
S611	EVQ21405R	STOP	
S612	EVQ21405R	PLAY	
S613	EVQ21405R	F. SKIP/SEARCH	
S614	EVQ21405R	PAUSE	
S615	EVQ21405R	OPEN/CLOSE	
		CONNECTOR(S)	
CN401	RJS1A6814	CONNECTOR(14P)	
CN402	RJS1A6823	CONNECTOR(23P)	
JK401	RJT065K19	CONNECTOR(19P)	
		EARTH PLATE(S)	
E1	SNE1004-2	EARTH PLATE	
		< LOADING P.C.B. >	
		INTEGRATED CIRCUIT(S)	
IC1	BA6418N	MOTOR DRIVE	

Ref. No.	Part No.	Part Name & Description	Remarks
		SWITCH(ES)	
S1	RSH1A005	STOCKER POSITION DET.	
S2	RSH1A032-U	PLAY POSITION DET.	
S3	RSH1A032-U	UP POSITION DET.	
S4	RSH1A005	TRAY OPEN DET.	
S5	RSH1A032-U	DISC NUMBER DET.	
		CONNECTOR(S)	
CN1	RJS1A6714	CONNECTOR(14P)	
		<SERVO P.C.B>	
		INTEGRATED CIRCUIT(S)	
IC701	AN8835SBE1	SERVO AMP	
IC702	MN662740RM1	SERVO PROCESSOR	
IC703	AN8389SE1	COIL & MOTOR DRIVE	
		TRANSISTOR(S)	
Q701	2SB709S	TRANSISTOR	
		OSCILLATOR(S)	
X701	RSXB16M9J02T	OSCILLATOR(16.9344MHz)	
		SWITCH(ES)	
S701	RSM0006-P	REST DETECTOR	
		CONNECTOR(S) AND SOCKET(S)	
CN701	RJU035T016-1	SOCKET(16P)	
CN702	RJS1A6723-1Q	CONNECTOR(23P)	
		<GREASE OR JIG/TOOL>	
		TEST DISC	
SA1	SZZP1054C	PLAYABILITY TEST DISC	
		GREASE	
SA2	RFKXPG671	MOLYCOAT GREASE PG671	

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